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Contemporary Pedagogies in Teacher Education and Development

Edited by Yehudith Weinberger and Zipora Libman

CONTEMPORARY PEDAGOGIES IN TEACHER EDUCATION AND DEVELOPMENT

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Notice

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Meet the editors

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Contents

Preface

As with most dynamic activities that are based on social and cultural contexts and rely on interactions, education is a complex and often ambiguous endeavor. Despite this complexity, however, scholars and educators are often required to find ways of defining and explaining what "good" teaching is and to incorporate these conclusions into teacher education. What are the characteristics of "good" teacher education? What sorts of knowledge and skills should it include? How might these elements be introduced, as pedagogical amendments, into existing programs for teacher education? This book offers some comprehensive ideas in response to such questions, based on an international overview.

The book contains eight scholarly chapters from various countries around the world: Finland, Ireland, Israel, Taiwan, Australia, and the United States, which offer unique and up-to-date perspectives on relevant practices and pedagogies for teachers' professional education and development in the present age. Methodologically, the chapters are mixed—half of them based on theoretical research and an extensive literature review, and the other half on the findings of empirical studies in various educational fields. The chapters are divided into two sections based on content. The first section presents strategies, models, and policies that represent system-level factors that can support teacher education or professional development programs. The second section offers several examples of innovative learning and teaching practices implemented at the level of the individual teacher in a variety of educational settings.

The first section begins with Jari Lavonens' chapter "Contemporary Pedagogies in Teacher Education and Development," which presents a comprehensive, collaborative endeavor in Finland's educational system, designed to analyze and to improve pre- and in-service teacher education. This extended brainstorming process emphasizes the need for an ongoing search for appropriate ways of updating educational processes and the crucial role of the teacher in the education system. An important aspect of system-wide change is the participation of teachers, so that they can be involved in generating solutions, receive professional support, take responsibility for the design of teaching and learning, and later take ownership of processes and successes. Professionalization processes of this type are a source of strength and considerable empowerment for teachers.

The issue of teachers' power and empowerment is discussed in depth by Aishling Flaherty in her chapter "Power and Empowerment in Schools." The author stresses the significance of power and empowerment as features of teachers' professional knowledge and illustrates how the effective and aware activation of power shapes all individuals' experiences in an educational institution.

Another crucial aspect of teachers' professional knowledge is their ability to address the diversity and multiculturalism that characterize present societies. Marita Mikinen discusses

this in her chapter "Curriculum Ideologies Reflecting Pre-Service Teachers' Stances toward Inclusive Education." In this chapter, Mikinen points out two types of tension between preservice teachers' curriculum ideologies—"knowledge versus experience" and "adoption versus reconstruction"—and suggests some ways to enhance the implementation of inclusive education in teacher education. The pedagogy of inclusion does not only emphasize the importance of offering individualized attention to each learner, but also, more significantly, cultivate all learners' interpersonal, social, and emotional competencies.

In this section's final chapter, "Facilitation of Teachers' Professional Development through Principals' Instructional Supervision and Teachers' Knowledge-Management Behaviors," Chen Chien Chin suggests practical tools for improving teachers' abilities to establish collaborative relationships and strengthen their self-regulation to benefit their students. This chapter highlights the central role of the principle in this process as well as the importance of collaboration and the ability to work in a team by engaging in productive dialog with different people who think differently.

Section 2 opens with Christine Edwards-Groves' chapter "Knowing Pedagogical Dialogues for Learning: Establishing a Repertoire of Classroom Interaction Practices as Core Teaching Practice." In this chapter, she presents the value of dialog and the meta-awareness of dialogic approaches, as well as meta-language, to meaningful dynamics and productive learning among pupils and student teachers.

This emphasis on the value of metacognition is continued in Anat Zohar and Elina Lustov's chapter "Challenges in Addressing Metacognition in Professional Development Programs in the Context of Instruction of Higher-Order Thinking," which focuses on teaching higher-order thinking in science classes. In this chapter, Zohar and Lustov explain why metacognitive teaching is very rare and stress the necessity of fostering teachers' metacognitive knowledge, strategies for employing metacognition, and the pedagogical capabilities required for teaching higher-order thinking.

As the first two chapters in this section suggest, educational programs at every stage (for both teachers and their students) should emphasize the development of a core set of intellectual competencies. These include not only critical thinking and creativity but also the ability to solve complicated problems in unconventional ways, cope with complex situations, and formulate a position and make decisions in situations that are contradictory and sometimes ambiguous. Examples of such capabilities are featured in Maya Wizel's chapter "Preparing Educational Hackers," which describes her study of teachers' innovative approaches to effective teaching and learning. In her research, Wizel examined the characteristics and conditions under which teachers "hack" their classroom pedagogy and found recurring elements in their professional identity, educational idealism, and motivation. The framework of hacking offers a fresh lens through which to view and reconstruct teacher education.

The final chapter in this section, "Teachers' Knowledge Integrating the Curriculum: A Current Challenge for Finnish Subject Teachers," delves into the notion of promoting meaningful learning by connecting a number of subjects and creating integrated learning opportunities. Meaningful learning obligates the learner to go through a process of change. Despite the traditional separation between cognition and emotions in learning, neuroscience studies have shown that cognitive and emotional processes are intertwined, so that emotions influence learners' understanding during the learning process, and learning processes influence learners' emotional state. In this chapter, Mikko Niemela and Kirsi Tirri offer some

suggestions for schoolwork and teacher education designed to better prepare teachers for the challenge of meaningful learning, addressing the particular kind of knowledge and preparation that is required. Compared to traditional learning, addressing the curriculum from a multidisciplinary perspective requires teachers to be innovative, flexible in their thinking, and, above all, to maintain distinct competencies in the field of metacognition, including pedagogical knowledge that is specific to that field.

In summary, this book suggests contemporary perspectives for pedagogy in teacher education and development, emphasizing lifelong learning, collaboration, empowerment, inclusion, dialog, innovation, meaningful learning, and metacognition. Many of the chapters in this collection reflect on the impact and implications of globalization, and the ever-present need it has created for us to learn from and about each other. On the one hand, there is clear evidence that education, and especially teacher education, is a distinctly context-reliant endeavor. On the other hand, there are also benefits to taking a more international perspective, which offers a wider range of perspectives and interpretations of educational theory and practice. In this international book, it is argued that there is a significant benefit to investigating the policies and practices of *other* teacher education systems from all over the world, not to imitate them, but to be inspired and enriched by them through a strategic bridging between different cultures and traditions.

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Section 1

Strategies, Models and Policy in Teacher Education

Chapter 1

Educating Professional Teachers in Finland through the Continuous Improvement of Teacher Education Programmes

Jari Lavonen

Additional information is available at the end of the chapter

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Abstract

The chapter analyses teacher professionalism and how professional teachers are educated in Finland and will be educated in future. Second, successes and challenges in the Finnish educational context and the role of teachers in education are discussed. The third section examines shortly primary and secondary teacher education at the University of Helsinki as an example of a teacher education programme in Finland. The main topic concerns how Finnish teacher education is aimed to be improved through broad-based collaboration. The Minister of Education nominated 100 experts from universities, the ministry, the teachers' union, student unions and municipal union to a *Finnish Teacher Education Forum* and asked them to analyse research outcomes related to teacher education, to identify best practices based on teacher education strategies and policy documents in other countries, organise a national brainstorming process related to the renewal of teacher education and, finally, prepare a *Development Programme for Teachers' Pre- and In-service Education* (life-long professional development) in Finland. Furthermore, the forum was asked to identify key actions to undertake to improve teacher education and support the implementation of the development programme, and also to create the conditions through financing pilot projects and organising meetings for the renewal of Finnish teacher education through professional development projects.

Keywords: teacher education, education policy, professional teacher, effective teacher, strategy and strategy implementation

1. Introduction

The Finnish education system offers an interesting and internationally recognised example of a high-performing system that successfully combines high quality with widely spread equity and social cohesion through reasonable public financing [1, 2]. The Finnish system differs in several ways from most other European countries and the US.

The quality of Finnish education has been promoted through a decentralised approach since the 1990s, in all areas of governance. Following this decentralisation, only basic guidelines are prepared at a national level, such as framework curricula and teacher education strategies. Finland has never based its educational system on standardised testing, as have many countries that follow an outcome-based educational model. Providers of education, typically municipalities, have been responsible for quality assurance and the preparation of local curricula, in collaboration with local stakeholders and families.

Teachers in Finland are highly educated. All teachers at the elementary, middle and high school levels are required to have a Master's degree. In fact, the education of elementary teachers (Grades 1–6) at the Master's level has been entrenched for 35 years, while secondary teachers (Grades 7–12) have been trained at Master's-level programmes for more than 100 years. An essential characteristic of teacher education in Finland has been its emphasis on research [3]. Following this perspective, student teachers learn both how to consume and how to produce educational knowledge. This research knowledge is needed for local curriculum planning and the development of teaching and school practices, as well as for the assessment of teaching and learning. Consequently, quality is assured primarily at the teachers' level. Over recent decades, studies have indicated that local curriculum processes have inspired and empowered teachers and principals to develop the local curriculum and their own work processes and, moreover, to increase the quality of education overall. Education authorities and national-level education policymakers trust professional teachers [4, 5].

The teaching profession in Finland has always enjoyed great public respect and appreciation [6]. There are several reasons why teaching is an attractive occupation in Finland. In addition to the academic status of teachers, they enjoy collaboration with and receive support from school leaders and communities. Moreover, national education policy and its practical implementation, including the strong culture of quality and the key role of teachers in assessment activities, support the professional ethos of teachers [7]. Decentralisation allows teachers to consider local contexts and to address diversity among the students they teach. Decentralisation in education is strongly linked to the Finnish way of interpreting teacher professionalism and the status of teachers in Finnish society.

The aim of this chapter is to analyse *how professional teachers are educated in the Finnish educational context and how teacher education has improved to position the teaching profession for new and challenging contexts in the future*. First, a short overview of the research on teacher professionalism and effectiveness is introduced. Then, the successes and challenges of the Finnish educational context and the role of teachers in this environment are discussed. Third, primary and secondary teacher education at the University of Helsinki is shortly introduced as an

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example of a teacher education programme. Finally, an analysis of teacher education reform will be offered, concentrating on how the pursuit of this goal has been supported through collaborative strategies.

2. Teacher professionalism as an aim in teacher education

A key goal of teacher education in all countries is to educate high-quality, *professional teachers* through a high-quality post-secondary programme and then support teachers through their career in professional development. However, different definitions and interpretations have been offered concerning teacher professionalism. Several other terms, including effective, competent, expert, or ideal teachers are used in a similar way as a *professional teacher* [8–10]. Teacher quality is typically approached by analysing (1) the knowledge base of a professional teacher (input approach), (2) the process or the interaction that occurs in the classroom between the teacher and students (process approach) or (3) the outcomes of the teaching and learning process, such as students' learning outcomes measured by national tests or graduation rates (output approach) [10]. In the first case, teachers reaching high levels of quality are typically called professional teachers and in the third case, referred to as effective teachers.

According to the 'input approach', a professional teacher is supposed to have a versatile knowledge base, allowing him or her to act as an autonomous professional. The term 'knowledge' is interpreted broadly in this context and is close in meaning to 'competence' or 'skill'. This knowledge base is supportive for the planning, organising and evaluation of teachers' own teaching, students' learning and their learning outcomes. Planning, broadly conceived, includes all steps from the planning of the local curriculum to the planning of a single lesson. Finland has followed this input type of orientation in the education of professional teachers.

Teacher professionalism does not only refer to the competence of individual teachers but also to their status. Overall professionalism depends on factors operating at the school level and on cultural and education policy as well as such individual characteristics as their knowledge base, teaching philosophy and interaction and collaboration skills [11]. Important school-level factors include the nature of school leadership, the culture of collaboration and the structure of networks and school-society-family partnerships. Cultural and education policy factors include the state-level context, including whether the country is following a more accountability-oriented educational policy or whether it trusts teachers without relying heavily on practices of inspection and testing.

2.1. Shulman's model of teachers' professional knowledge

To characterise teacher professionalism, a description of their knowledge base is the logical starting point. One well-known approach for describing this knowledge base is Shulman's work [12, 13], in which he made the distinction between different domains of knowledge for teaching, including content (subject matter) knowledge, pedagogical content knowledge and curricular knowledge [14, 15]. The level and depth of teachers' knowledge in these domains are the basis of professionalism [16, 17].

Content (subject matter) knowledge in a certain domain includes both conceptual and procedural knowledge. Furthermore, a teacher needs to understand the nature of the knowledge, that is, the underlying epistemological and ontological issues. The second knowledge category is *pedagogical content knowledge (PCK),* which is a knowledge domain that distinguishes teachers from other subject specialists [13, 17]. PCK is the synthesis of all knowledge needed for teaching and learning a certain topic [14]. In Finnish education context, instead of PCK subject pedagogy or didactics is used as a term. The third main category of teacher knowledge is *general pedagogical knowledge* (GPK) [18]. Morine-Dershimer and Kent [19] argue GPK consists of the following areas: (1) classroom management and organisation, (2) instructional models and strategies and (3) classroom communication and discourse. Schulman's original model has been augmented, for example, Gess-Newsome and Lederman [15] introduced the topic of teachers' *contextual knowledge* and define it as knowledge of the context of teaching.

Research on teacher knowledge typically focuses on the knowledge teachers need in classroom situations; however, they also need certain knowledge outside their classroom activities. For example, retaining and enhancing their professionalism requires competences for both networking and life-long learning.

2.2. Competence for networking and partnerships

Networking both in and out of school, and also cultivating partnerships, are important areas of competence for professional teachers. Networks allow the sharing of ideas, opinions and experiences and are also important in the creation and adoption of educational innovations [20]. In a partnership, at least two parties are engaged in collaborating in pursuit of common aims. Networks such as grade-level teams and principal teams and, moreover, networks with healthcare experts are important in-school networks.

Moreover, networking and partnerships are needed in engagements with entities outside the school, including organisations and companies in the surrounding community, and especially with parents. School-family partnerships can be cultivated through school-family events and personal meetings to support communication and the clarification of shared goals.

2.3. Competence for life-long-learning

Another competence that is missing from the knowledge base initially defined earlier is the competence for life-long learning. A professional teacher is ready to learn new knowledge needed in the teaching profession. This competence is often assumed to be developed through the study of research methodology and engagement in research activity. Therefore, a professional teacher is viewed as both a critical user as well as a producer of educational knowledge [21, 22].

A professional teacher is a user of educational knowledge when theory and practical experience are combined and when educational situations are interpreted through reflection. *Reflection* refers to the process in which an experience is recalled, considered and evaluated, usually in relation to a broader purpose. Rodgers [23] describes reflection as a meaning-making process comparable to the research process and lists phases of reflection: setting aims and recognising the problem(s), observing one's own behaviour in practice, describing observations and

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analysing observations and experiences. Moreover, this type of knowledge and competence is needed in planning, broadly conceived, including the preparation of the local curriculum, the implementation of teaching and learning activities and the assessment of teachers' teaching.

3. The context of Finnish education

Equality is an important value in Finnish education. Free education is available at primary, secondary and tertiary levels. Moreover, free health care, counselling and library services are available for students at all levels. Special education in Finland aims to integrate all kinds of learners into the same classrooms and prevent students from dropping out. The goal of low early school leaving (ESL) levels is emphasised in Finnish education policy documents [24]. However, the equality of educational outcomes has deteriorated according to gender, students' socio-economic status and migration background and according to the area the students live in [25].

Another characteristic of the Finnish education system is its strongly decentralised structure and its culture of trust. Trust means that educational authorities and national-level policymakers trust teachers, together with principals, headmasters and parents, to know how to provide the best education for children and youth in a particular district. Schools and teachers have been responsible for choosing learning materials and teaching methods since the beginning of the 1990s, when national-level inspection of learning materials was terminated. Education providers or municipality-level education administrators, schools and teachers are responsible for quality assurance. Teachers are valued as professionals in curriculum development, teaching and assessment at all levels. On the other hand, decentralisation poses challenges for efforts to improve educational practices and implementation of national level′ initiatives.

3.1. Basic and upper secondary education

New national-level curricula for basic (primary and lower secondary) and upper secondary education were prepared between 2012 and 2014 in close collaboration with teachers, teacher educators and providers of education (municipalities) [26, 27]. Both curricula emphasise the learning of twenty-first century competences and offer support to teachers as they confront such key questions as: what will education mean in the future, how can education prepare all young people for the future, what competences will be needed in everyday and working life and what kinds of learning environments and practices or teaching methods would best produce the desired education and learning outcomes.

3.2. Recognised challenges in Finnish education context

Several challenges have been recognised recently in Finnish education. When the Programme for International Student Assessment (PISA) 2012 [26] and 2015 reported declines in the proficiency of Finnish youth, Finnish policymakers argued that the educational system is failing to promote the twenty-first century skills that will adequately prepare students for the future. Another discussion concerns the challenges linked to the impact and use of new technologies in and out of school situations [2]. The 2013 Teaching and Learning International Survey

(TALIS) [28] demonstrated several weaknesses in the operation of schools and in teacher activities. According to the TALIS, most Finnish teachers find that they have influence over the factors that promote learning. However, teachers' participation in ongoing training to support professional development appears to be declining. Moreover, the orientation of new teachers to the profession is seen to be poorly organised in Finland. Teachers feel that initial teacher education does not prepare its graduates well enough for collaboration between home and school, networks with healthcare experts, controlling disruptive behaviour in the classroom or managing the needs of more challenging students.

Because of the decline in students' learning outcomes and low engagement in learning, perceived weaknesses in teachers' competences, the weak organisation of professional development projects and the public debate suggesting gaps in crucial twenty-first century competences, several national projects have been launched in Finland since 2014, including the *Future primary and lower secondary education* [29] and a national project aiming to renew upper secondary education [30]. The preparation of national core curricula for basic (primary and lower secondary) and upper secondary education [26, 27] has been part of these endeavours. Moreover, a special teacher education development programme [33] was established in order to overcome the challenges introduced earlier. These challenges were also introduced several times to the *Finnish Teacher Education Forum* by the author of this chapter (chair of the forum) and, moreover, discussed while planning the new strategy in the forum.

4. Current teacher education practices in Finland

Several researchers have argued that the most important reason for Finnish students' relatively high success in PISA is the professionalism of teachers. In general, the positive impact of good teachers on the learning and well-being of students is widely accepted (e.g., [34]). The professionalism of Finnish teachers is interpreted according to the perspectives set out in the previous section, on teacher professionalism. For example, the 2002 *Finnish Teacher Education Development Programme* [35] stated that Finnish teacher education programmes should help student teachers to become professionals and acquire, among other things, the following:

- high-level content/subject matter knowledge, pedagogical knowledge, pedagogical content knowledge, contextual knowledge and knowledge about the nature of knowledge; social skills, such as communication skills, skills involved in cooperation with other teachers and information communication technology (ICT) skills; moral knowledge and skills, including the social and moral codes of the teaching profession;
- skills required for effective cooperation with other teachers and those involved in partnerships with the school-community (local contexts and stakeholders) and with parents; knowledge about schools as an institution and their connections to wider society;
- academic skills, such as research skills; skills needed for developing local curricula, planning teaching activities and organising the assessment of teaching and learning and the skills needed to develop one's own teaching practice and contribute to the teaching profession.

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There is a long tradition in Finland of educating primary and secondary school teachers at universities in 5-year Master's-level programmes. Since the 1960s, the objective of teacher education has been to educate professionals who are able to plan, implement and assess their own teaching and their students' learning. Autonomy as a part of Finish teachers' professionalism has contributed to teacher education being one of the most highly sought-after training programmes at Finnish universities. For example, at the University of Helsinki only 5–10% of applicants in 2016 were accepted to the programme.

4.1. Secondary teacher education at the University of Helsinki

Secondary teacher education is organised in cooperation with the departments of specific subjects at six faculties within the University of Helsinki, along with the Faculty of Education. Studies are divided into two parts: each of the subjects is studied within its own department (e.g., Physics) while pedagogical studies take place within the Faculty of Education and Teacher Training Schools. Students enrol in two subjects they intend to teach: one major and one minor subject. The Faculty of Education is responsible for organising the studies for the required 60 credit points (cp) of pedagogical studies (identified as a second minor for the degree). In addition, 20 credit points are allocated for teaching practice, giving the students the qualifications necessary for teaching positions in all types of schools, in their major and minor subjects. The students define topics for their Bachelor's and Master's theses (40 cp) and prepare the thesis under the guidance of a professor or within a research group. In addition, each student prepares a pedagogical thesis.

An essential characteristic of primary and secondary teacher education in Finland is an emphasis on research [3]. From the point of view of this orientation, student teachers learn how to both *consume* and *produce* educational knowledge within their pedagogical studies [21, 22]. Students consume knowledge based on educational research when they combine theory and experience or interpret situations during their practice teaching. Students acquire a capacity to produce educational knowledge during their courses in research methodology and while conducting their educational research projects (Bachelor's, pedagogical and Master's dissertations) [18]. The knowledge and skills they learn during these thesis projects support life-long learning practices.

Practice teaching makes up one-third of the pedagogical studies credits. During practice teaching, the students are supported to transform practitioner (practical) knowledge into professional knowledge through reflective activities and guided discussions in small groups. *Reflection* here refers to the process in which an experience is recalled, considered and evaluated in the effort to learn from practical experience. Teacher mentors who supervise practice teaching at teacher training schools support student teachers in their meaning-making process by facilitating goal-setting, self-observation and the description and analysis of observations and experiences to improve their teaching practice [23]. Supervision is critical at this stage, and trained mentors help the students to reflect on all the possible aspects of their work as teachers. During the advanced stages of practice teaching, student teachers become increasingly independent, and discussions with supervisors are expected to become deeper and more detailed. Consequently, student teachers learn from their own practice but also master the process of reflection. Such reflective skills are essential to life-long learning.

4.2. Primary teacher education at the University of Helsinki

The structure of a Master's degree for primary teachers is quite similar at all Finnish universities to the structure of subject-based degrees for secondary teaching. From the 140 cp allocated for education as the major subject, 50 cp consists of studies of the actual knowledge base, such as understanding the cultural, psychological and pedagogical features of teaching and instruction. As much as 70 cp are devoted to methodological studies. It is important that student teachers study quantitative, qualitative and mixed methods to develop a comprehensive understanding of methodological issues in the human sciences. A student in primary education undertakes a Master's (M.A.) thesis of 40 cp during these studies. Conducting one's own research process improves a student's understanding of the relationship between theoretical knowledge and practice and offers the possibility of developing the orientation of a reflective practitioner-researcher to the everyday work of teaching.

Besides the major in education, *subsidiary subject studies* (60 cp) as a first minor subject adds to the knowledge base of primary teachers. *Subsidiary subject studies* address the pedagogy of all primary school subjects, along with cross-curricular themes to be implemented in various subjects at the primary level. The aim of this minor subject is to understand curriculum theory and its relevance to the planning, instruction and evaluation of educational practice. In addition, it is important to construct meaning for the distinct characteristics of each field of knowledge behind the primary school subjects. Student teachers need to understand the link between the scientific orientation and the methods used in teaching subjects to learners in a school environment.

Besides these *subsidiary subjects studies* courses, students in primary teaching may complete an elective minor subject (60 cp) in one of the school subjects. The elective study module qualifies the student to teach this particular subject at the lower secondary level (Grades 7–9). The minor subject studies are offered by subject departments and are based on scientific knowledge of the field.

The knowledge related to the teaching of school subjects is strengthened by teaching practice modules included in the programme. One aim is to emphasise a theory-practice relationship by establishing connections between theoretical studies on campus and practice teaching at the partner school. Altogether, 20 cp are allocated to teaching practice during these studies. The multidisciplinary teaching practice module focuses especially on pedagogical content knowledge relating to various classroom subjects. Student teachers have the opportunity to practice and improve their skills in teaching different subjects based on previous theoretical studies. During the final practice teaching session, normally completed during the fourth or fifth year, the aim is to strengthen the interaction between particular school subjects and the educational aims of upbringing young children in the primary school setting.

5. Recognising new aims for Finnish teacher education through collaboration and analysis of research outcomes

As described in the previous section, several challenges were recognised in Finnish education and education ecosystem based on the PISA and TALIS survey results [25, 28]. These challenges were discussed and summarised in the forum meetings as follows:

- *student-level challenges*: lack of support for students' well-being and engagement in learning; challenges in guiding students to active learning processes; challenges in responding to the needs of individual learners and challenges in integrating formative and summative assessment;
- *classroom level-challenges*: teaching in a heterogeneous multicultural classrooms; emphasising the learning of twenty-first century competences and designing and making effective use of various learning environments;
- *school and city-level challenges*: working and planning curriculum in teams; teacher networking; evaluating current education practices; planning and implementing improvements or education reforms and using digital tools in teaching and administration;
- *society-level challenges*: supporting sustainable development; preventing drop outs; how to take into account machine intelligence and automation in education and business.

As one response to these challenges, a *Finnish Teacher Education Forum* [31, 32] was established by the Ministry of Education in February 2016 to foster the development of teacher education as a part of the national reform programme [36]. The minister nominated almost 100 experts from universities, ministry, the teachers' union, student unions and municipal union to the forum and asked them

1. to analyse research outcomes related to teacher education,
2. to identify best practices based on teacher education strategies and policy documents in other countries,
3. organise a national brainstorming process related to the renewal of teacher education and, finally,
4. to prepare a *Development Programme for Teachers Pre- and In-service Education* (on life-long professional development).

The outcomes of the previously mentioned actions 1–3 and the recognised challenges were discussed collaboratively and transformed to strategic aims in the meetings of the *Finnish Teacher Education Forum*. This collaborative analysis of the actions and challenges supported the nominated experts to become aware of these challenges and new national aims. Moreover, the nominated experts were asked to be responsible for the local level development projects and renewal of teacher education in each university.

The forum was also asked to recognise key actions to improve teacher education, to support the implementation of the development programme and to create the conditions for the renewal of Finnish teacher education through development projects. The programme was asked to describe the kinds of teacher education and continuous professional development that are necessary to ensure that teachers support students in the classroom to learn the competences (knowledge, skills and attitude) needed today, tomorrow and in future.

5.1. Outcomes of the literature review on research on teachers and teacher education

The literature review [37] on research on teachers and teacher education undertaken by the forum identified several important perspectives, which were discussed in the forum meetings

and taken into account in the planning of the development programme. In particular, research outcomes related to the role of education in a society; teaching and learning, engagement and individual differences of learners; the design and use of educational innovations, like education technology, in teaching and learning and, moreover, the research on teachers and teacher education had an impact on the work of the forum (see e.g., [38]). One important topic discussed in the meetings was the link between teachers pre- and in-service training. According to the literature review, during pre-service training student teachers should be willing and able to learn new competences continuously in their work as teachers, including competences needed to organise inclusive classrooms, entrepreneurship education, networking and co-teaching.

One outcome of the literature review emerging from the perspective of classroom interaction and learning identified best practices for professional teachers. They should:

- support learners as they integrate new knowledge with previous knowledge using effective pedagogy; anticipation and solution-oriented approaches;
- guide learning through classroom interaction;
- monitor learning and give feedback to learners;
- take into account the affective dimensions supportive of learning, including respect for pupils and a passionate attitude towards teaching and learning;
- provide suitable challenges for learners; emphasise the acquisition of learning and self-regulation skills and encourage learners to develop self-confidence and self-esteem [39].

5.2. Outcomes of the benchmarking of teacher education strategies in neighbour countries

Teacher education programmes and strategies were benchmarked in neighbour countries and discussed in the forum meetings. For example, the Norwegian 2016 elementary teacher education strategy (framework) aims to raise the Norwegian teacher education credential to the Master's level and augment expectations of teachers, in addition to traditional pedagogical competences: 'for example, *take responsibility for developing and leading inclusive, creative, safe and healthy learning environments (skill)'* in the classroom, as well as competences needed to contribute to the professional community of teachers: able to '*contribute to both colleagues and the school's professional and organisational development*' [40]. Compared to previous national strategies, the new Norwegian strategy emphasises a research orientation in teacher education—*academic knowledge and knowledge on scientific thinking and research methods*—along with improved competences in teacher collaboration, personal and whole school environment development.

In Sweden, a renewal of teacher education aims to update it to the Master's level, similar to the initiative in Norway [41]. According to Swedish documents, for the degree of Master of Arts or Science in secondary education the student shall demonstrate the competences needed to participate autonomously in the teaching profession *the knowledge and skills required*

to work autonomously as a subject teacher in the specialisation and competence needed in the development of learning environments—the *capacity to create conditions in which all pupils can learn and develop (skill)*—and the school environment: *the capacity to plan, implement, evaluate and develop teaching and educational processes individually and together with others*.

5.3. Outcomes of the national web-based brainstorming process

As one of its activities, the *Finnish Teacher Education Forum* organised a national web-based brainstorming process related to the renewal of teacher education following the concept of the 'wisdom of crowds' [42]. According to this principle, a large group of people is collectively smarter than a few experts and is more likely to come to wise decisions. In practice, a call to participate was sent to teacher educators in all Finnish universities, as well as to all teachers and administrative employees working in the field of education at both national and local levels. The goal of this invitation was to solicit diverse opinions related to the development of teacher education, encouraging decentralisation of idea generation and independent thinking. The participants were first guided to generate ideas about what will be important in the future of teacher education and to evaluate or rank about 10 ideas contributed by others. In the ranking, participants assigned a number (from 0 to 100) evaluating the importance of these ideas. The web-based brainstorming tool combined similar ideas and reduced the number of ideas offered for ranking. According to participants, the most important priorities for students to learn in teacher education are learning-to-learn skills, along with interaction and collaboration skills. The same skills were also emphasised in the recent Norwegian and Swedish teacher education strategy papers and emerged from the teacher education literature review. The competences involved in generating ideas, readiness for change, research-based action and collaboration in partnerships and networks are all needed so that teachers can participate collaboratively to develop classroom practices and culture in particular school contexts. Most of the top-ranked skills and competences identified are needed outside the classroom. This means that, in teacher education, participants believe that more attention should be paid to the skills and competences needed for effective teacher collaboration. Meanwhile, interaction and collaboration skills, student-centredness and the competences to meet variation, integration of school subjects, digitalisation and the use of various learning environments are skills, competences and attitudes needed by effective, professional teachers in a classroom environment.

5.4. Strategic aims for Finnish teacher education

Altogether, the forum organised eight full-day meetings of the entire forum, along with several meetings of smaller thematic groups, during 2016 and 2017. The steering committee of eight people met every month, discussing outcomes of the literature review, best practices based on teacher education strategies and policy documents in other countries and the brainstorming process and designing the *Development Programme for Teachers Pre- and In-service Education*. This development programme [31] set out holistic competence goals for teachers' pre- and in-service education and continuous life-long professional development. According to this document, a professional teacher should have:

5.5. A broad and solid knowledge base

- Subject matter knowledge, pedagogical and pedagogical content knowledge, contextual knowledge;
- Interaction skills and skills for collaboration in different networks and partnerships (experts at school, family and society collaboration);
- Knowledge about learning and diversity among learners (including special needs and multicultural backgrounds);
- Competence to act as an autonomous professional who can plan, implement and assess his or her own practices and students' learning;
- Competence to act in various digital and physical learning environments, including digital skills and learning in settings outside the classroom;
- Professional ideology, including a shared understanding of professional values and ethics codes (e.g., expectations for ethical conduct towards (1) students, (2) practices and performance, (3) professional colleagues and (4) parents and community);
- Research skills (skills required to consume research-based knowledge);
- Awareness of the different dimensions of the teaching profession: the social, philosophical, psychological, sociological and historical bases of education as well as schools' societal connections;
- Awareness of various cross-curricular topics, including those related to human rights and democracy, entrepreneurship education, sustainable development and globalisation.

5.6. Expertise in generating novel ideas and educational innovations

- A positive attitude towards continuous change, which requires tolerance of uncertainty and new and innovative ways of thinking;
- Willingness to create a positive atmosphere supportive of creative processes and curiosity, risk-taking related to classroom teaching and learning, creation of educational innovations and, moreover, awareness of the importance of this attitude for creative outcomes;
- Competences necessary for the implementation of creative processes, the generation and evaluation of ideas related to classroom teaching and learning and the creation and adoption of educational innovations;
- Competences required to design a school-level curriculum, to implement it and continuously to evaluate and improve it;
- Research skills (skills to produce research-based knowledge).

5.7. Competences required for the development of their own and their schools' expertise

- A supportive attitude towards different occupational groups;
- Self-regulation skills and skills for control over their work (skills for self-assessment);

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- Competences involved in working in networks and teams, such as networking with health-care experts at the school site;
- Competence in curriculum design and as an innovator for pedagogical approaches and learning environments;
- The ability to facilitate, coach, mentor or train other teachers;
- Competence to reflect on their own personal pedagogical views (reflection for, in, and on action);
- Competence for quality work, the competence to use assessment outcomes for school development and the ability to develop school culture through networks and partnerships with students, parents, other experts and stakeholders;
- Competence to develop their own expertise through reflective activities, research-based knowledge, mentoring, in-service training and seminars and workshops, along with the willingness to use this competence.

5.8. Implementation of the strategy

During the years 2017 and 2018, the forum has supported and will continue to support teacher education institutes to organise pilot projects according to main development areas, recognised in the development programme. In order to support the pilot projects, the forum has allocated two times 15 million euros according to the proposals submitted by the Finnish universities. The development projects were asked in the following areas:

- holistic view to teacher education,
- selection and anticipation,
- supporting the development of competences needed in generating novel ideas,
- collaboration culture and networks,
- supportive leadership,
- research based teacher education.

The experts nominated to the *Teacher Education Forum* were responsible for supporting the writing of proposals and support the starting of the development projects. Only the proposals, which were written according to the strategic aims, were funded.

Altogether, 32 development projects were funded and started. According to the content analysis conducted by the author of this chapter, the development projects were designed in collaboration between the universities and in collaboration with the providers of education (working life connection) and, moreover, they were research-oriented projects. The projects were emphasising the following topics:

- competence model to teacher education programme according to the strategic aims (21 projects),

- models for teaching and supervision in teacher education (14 projects),
- teacher leadership and leadership at school level (13 projects),
- digital environments in teacher education (12 projects),
- supervision of teaching practice (8 projects),
- multiprofessional team work, (7 projects),
- equity in education (7 projects),
- multicultural education and language education (6 projects),
- selection and anticipation (4 projects),
- special need education (2 projects).

6. New meaning and approaches to teacher professionalism

The Finnish teacher education policy and teacher education programmes have always emphasised the acquisition of a professional knowledge base, networking skills and the competence for life-long-learning, in a way similar to that emphasised in recent international research literature on teacher professionalism. The 2016 *Development Programme for Teachers Pre- and In-service Education* emphasises similar competencies. However, this new programme enhances the role of creativity and innovation in the teaching profession as new areas of competence. Teachers should become more able to generate ideas to solve problems or overcome challenges at a local level. Creativity is needed, for example, in the design of new learning environments or to organise an inclusive classroom. Second, the programme emphasises the development of the whole school context, especially versatile leadership, in addition to the competences of individual teachers.

Although new areas of competence have come to national policy attention, traditional areas of teacher knowledge are still emphasised. For example, Finnish secondary teachers in the future will continue to learn versatile subject matter knowledge in departments specialising in specific subjects. During these subject studies, student teachers become familiar with the epistemological and ontological basis of their subjects under the guidance of professors who are conducting their own research in the field. This kind of knowledge is relevant in school contexts when teachers guide students in different kinds of activities and problem-solving. Furthermore, student teachers learn pedagogical knowledge and pedagogical content knowledge during their studies, both at subject departments and at the Faculty of Education.

In addition to previous traditional domains of teacher knowledge, students will continue to learn how to critically consume and to produce educational research, as student teachers have learned since the 1960s. This research orientation in teacher education is important for the development of competences for life-long learning. The research orientation in teacher education also supports the development of competences involved in planning of teaching activities, broadly conceived, as well as versatile assessment. Finnish teachers must follow

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their students' progress formatively and support the learning of their students as well as pay attention to students with special needs. Teacher effectiveness is not considered a characteristic of individual teachers; rather, it is strongly associated with the characteristics of the whole educational context, including national Finnish educational policy and the organisation of education in practice through the national and local-level curricula. These competences are needed in life-long-learning.

The professionalism of teachers in Finland is also not a property of individual teachers but, rather, it refers to characteristics of teachers as a group and depends on cultural and education policy factors at both national and school levels. The *Development Programme for Teachers Pre- and In-service Education* emphasises teachers' collaboration and the development of the whole school context; this social interpretation of teacher professionalism is emphasised more than in previous policy documents. Collaboration and the development of school culture have also recently been emphasised in Finland's neighbours, Norway and Sweden. In contrast to the top-down systems established in many other countries, the Finnish educational system is characterised by the devolution of decision-making power and responsibility to the local level: based on the National Core Curriculum, teachers plan the local curriculum collaboratively [13, 14]. In addition, teachers are responsible for student assessment and for the evaluation of their own teaching; there is no national-level testing or inspection in state-funded education. Therefore, teachers have an important and influential role in school education and teaching.

Both Finnish education policy and the Finnish education system support teachers in their professional role [11]. This role as well as the knowledge and skills (competences) needed in the teaching profession are learnt during teacher education. These competences help teachers to act as academic professionals, collaborate in school communities and continuously learn new competences. This professional orientation, including the cultivation of research skills, has recently also been emphasised in Finland's neighbouring countries, Norway and Sweden.

When Finnish education and teacher education policy and their implementation are compared to the global education trends, a couple of contrary movements can be recognised [1]. In general, Finnish education policy represents a long-term orientation and is not based on ad hoc ideas coming from the politicians. New strategies are planned collaboratively and in partnership with unions of teachers and other employees and aim at consensus in the planning process. Resources are made available for the piloting and implementation of innovations.

An important movement globally, beginning in the 1980s, was the tendency towards outcome-based education reforms. This movement was followed in the 1990s by standards-based education policies, beginning in the UK and the US, including centrally prescribed performance standards for schools, teachers and students. Nationwide testing of students' learning outcomes is another outcome-based policy. By contrast, within the framework of the Finnish national-level curriculum, teachers collaboratively create local curricula at the municipal and school levels. The local curriculum is both a process and a product. The nature of the process empowers teachers in their planning processes and increases their ownership of the curriculum. Therefore, teachers need training and preparation to work in this context and, in their teacher education, acquire the necessary competences.

In the Finnish educational context, external demands are not visible in everyday school practice to guide teachers' work, including their assessment practices. This atmosphere supports teachers in developing school environments and teaching collaboratively. Competition and rankings hardly exist in Finnish education—the educational context supports collaboration, networking and partnerships. Finnish teacher education aims to support student teachers to learn how to collaborate, as well as how to plan and assess teaching and students' learning outcomes. However, certain challenges face the development of collaboration and broader networking skills through teacher education programmes.

One global trend has been consequential accountability systems for schools. Success or failure of schools and their teachers is often determined by standardised tests and external evaluations that devote attention to limited aspects of schooling. Again, in Finnish primary and lower secondary schools another direction has been chosen: trust based on the professionalism of teachers. An important pre-condition for trust is the high quality of teacher education and a broadly supported overall strategy. A culture of trust within the education system values teachers' and headmasters' professionalism in judging what is best for students and in reporting on the progress of their learning. While heavy testing and inspection do not characterise the Finnish system, school satisfaction is not high among students. Therefore, during initial teacher education, student teachers should learn how to take full benefit of the potentials inherent in the non-consequential accountability system in Finland. There is space for increasing co-planning, project work and encouraging and motivating forms of assessment.

To conclude, the Finnish approach to teacher professionalism and effectiveness is the 'input approach', according to which a professional teacher should have a versatile knowledge base and competence for networking, developing the school culture and life-long-learning. The construction of this knowledge base begins during Finnish teachers' initial teacher education. This education supports Finnish teachers' strong autonomy in curriculum design and in choosing instructional strategies and approaches to assessment. This autonomy is also supported through Master's-level teacher education, which supports pedagogical thinking and autonomous decision-making. Moreover, autonomy is supported through the cultural respect accorded to the teachers. Third, Finnish education policy offers a supportive environment for teachers in their autonomous roles.

The influence of the new *Development Programme for Teachers Pre- and In-service Education* and implementation of the development projects is too early to evaluate. The development projects have been working only half-year when this chapter has been written. However, based on the meetings of the forum and directors of the development projects, the Finnish teacher educators are eager to make progress in teacher education. All 32 development projects have started and they are having nationwide connections and meetings. There have been two meetings between November 2017 and February 2018. Altogether four national meetings are scheduled for the rest of the year 2018. The impact of the *Development Programme for Teachers Pre- and In-service Education* will be evaluated in the end of year 2018 by the forum itself and by external evaluators, nominated by the Finnish national quality office.

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Chapter 2

Power and Empowerment in Schools

Aishling Flaherty

Additional information is available at the end of the chapter

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Abstract

This chapter sets out to discuss the tenants of power and empowerment as features of teachers' professional knowledge. At the root of empowerment is power and this power works to shape the experiences of every individual within the school institution. While teachers may not have the ability to control some aspects of how power is operationalized within the school institution, teachers do have control over how they perceive and operationalize power in the classroom. As such, it is argued that the effective and conscious operationalization of this power is a key aspect of the professional development of teachers. This chapter explores the concepts of power and empowerment, their various conceptualizations and their implications on classroom teaching and learning processes. Through embracing empowerment as an educational philosophy, an account of how teachers can generate empowering learning environments for their students will be provided.

Keywords: empowerment, power, teacher education, classroom management, student learning

1. Introduction

Power and empowerment are intricately connected, yet, complex concepts which can have profound implications on the experiences of both teachers and students in the classroom. Being recognized as authoritative individuals with expertise in subject areas qualifies teachers to assume a power. A crucial aspect of teachers' professional knowledge is perceiving and operationalizing their power in a manner that does not oppress or inhibit students' creativity, critical thinking or independent thought but rather, they use their power to empower students. Beginning with a brief exploration of the concept of power in terms of its various conceptualizations and influences on school life, an account of how teachers can embrace their power in classrooms to empower students will be offered.

2. Power

At the root of empowerment is power and according to Nyberg, *"The idea of power has lain more completely neglected in education studies than in any other discipline that is of fundamental social interest"* ([1], p. 63). Tauber contends that if teachers desire to educate students to the degree which they are capable of successfully coping with an ever-changing and demanding world, they must exercise their power effectively [2]. However, the effective use of power is widely misunderstood by educators [3]. In order to begin to consider the effective use of power, educators need to firstly understand the concept of power but as Common informs, we all know perfectly well what power is—until someone asks us [4]. As a multi-faceted concept that is fundamental to understanding people, their motives, their goals and their actions [4], many scholars have postulated the meaning of power. According to Lukes, having power means that one has the ability to make a difference to the world [5]. Many other conceptualizations of power allude to the ability it affords an individual to have an influence on agenda setting and decision making [6, 7]. Ashcroft considers power as a fundamental personal construct that *"develops or stagnates in a social environment, and it functions in a social as well as a personal sphere; yet it is fundamentally a personal construct"* ([8], p. 148). Here, power is deemed to be intrinsic to individuals however, Arendt contends that *"Power is never the property of an individual, it belongs to a group and remains in existence only so long as the group keeps together"* ([9], p. 44). This follows on from interpretations of how power exists and functions in society. Foucault considers power as an inherently latent phenomenon that sees *"individuals circulate between its threads; they are always in the position of simultaneously undergoing and exercising this power. They are not only its inert or consenting target; they are always also the elements of its articulation"* ([10], p. 98). Foucault presents power as a mysterious system that ebbs and flows among individuals who are perceived as vehicles of power. As vehicles of power, these individual fuels the ebbs and flows of power. In stark contrast, Giddens interprets power to be intrinsic to human agency. Giddens ([11], p. 9) describes the concept of agency in concerning *"events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently. Whatever happened would not have happened if that individual had not intervened"*. As such, for an individual to have power, they would have the capability to act in a way that would "'make a difference". An individual who ceases or loses this capability to "make a difference" nullifies their agency and ability to exercise power. Unlike Foucault who considers power as an all-inclusive but latent phenomenon, Giddens acknowledges individuals as conscious and knowledgeable beings with the ability to create, influence, and limit power [11]. In the context of the school institution, if teachers and students akin are viewed as conscious and knowledgeable beings with the agency to act within their own desires, it is essential for teachers to understand how power manifests to influence teaching and learning experiences in their classrooms.

3. Power in schools

Power exists and functions in different ways in schools, both inside and outside the classroom. Outside the classroom, research describes how principals influence teachers through their use

of power [12]. By granting authority to principals, due to either their ability to distribute rewards or because of their knowledge and expertise, teachers qualify the power of principals [12]. While teachers may not have full control of how principals operationalize their power, teachers have full control of the power that they operationalize in their classrooms. Being recognized as authoritative individuals with expert knowledge and expertise in the classroom qualifies teachers' power. However, since gaining and exerting power is considered as a basic human need and within the classroom, this can implicate the learning environment [13]. For example, conflict can arise if needs for power by either teachers or students are unmet [14]. Teachers can exercise their power in different ways as described throughout Tauber's five bases of teacher power. Tauber [2] adapted the five bases of power conceived within the business world by French et al. [15] to purport the five bases of power that teachers wield in the classroom. These five bases of power include (i) coercive power, (ii) reward power, (iii) legitimate power, (iv) referent power and (v) expert power.

- Coercive power derives from the student belief that the teacher possesses the ability to punish or refrain from punishing. Some of the characteristics of this type of power include continuous and exhaustive teacher monitoring, emphasizing compliance rather than cooperation, student rebellion, retaliation, lying, cheating and withdrawing from learning.
- Reward power derives from the student belief that the teacher possesses the ability to distribute or withhold rewards not obtainable elsewhere. Such reward power involves introducing stimulants that students perceive to be pleasant such as recognition and privileges as well as removing stimulants that students perceive to be unpleasant.
- Legitimate power derives from the student belief that the teacher has the right to prescribe behavior given the status of their position. Here, teachers have the legitimate power to tell students what to do such as assigning homework and generally students accepts this assignment through respect for the status of the teachers' position.
- Referent power is a personal power that stems from students' identification with the teacher and their desire to be liked by their teacher. This power extends beyond the classroom as the student, in the less powerful position, bids to emulate the personal characteristics of teacher who wields referent power.
- Expert power derives from the student belief that the teacher possesses some special knowledge or expertise which is important for achieving a particular task they are presented with. Exercising theses power bases effectively is a professional obligation for teachers [2].

Although teachers' power may operationalize throughout these five power bases, detrimental consequences may arise if teachers operationalize their power in a manner that oppresses or inhibits students' creativity, critical thinking or independent thought. Educator and philosopher, Freire provides an account of how teachers can negatively use their power to oppress students by embracing the banking concept of education [16]. Here, this banking concept of education portrays education as a pursuit that is characterized by teachers depositing information into the minds of their students who go on to store this information. In this regard, students are passive in their acceptance of the information being deposited in their minds. By annulling students' creative power, their passive acceptance of information imbues habits of

mind that leads students to passively accepting the status quo of their existence in the world. As opposed to depositing information in students' minds, posing problems to students that encourages them to critically reflect on societal and power structures and how they influence students' life's *"can develop their power to perceive critically the way they exist in the world with which and in which they find themselves; they come to see the world not as a static reality, but as a reality in process, in transformation"* ([16], p. 83). However, it is within the interests of teachers to embrace the banking model of education because in its fulfillment, teachers retain their power [16]. Relinquishing their power by providing students with a space to critically reflect and question such influential structures may risk or threaten teachers' status and power. However, Freire encourages teachers not to exercise their power *over* students, but rather they should use it *with* students their journey of learning. The process of relinquishing power, as such, giving power to individuals is characteristic of an endeavor to empower [17]. Therefore, towards the generation of empowering learning environments, it is necessary for teachers to identify the power dynamics that establishes in their classrooms while enacting on such dynamics to relinquish some of their power to empower students.

4. Empowerment

Similar to the multi-faceted nature of the concept of power, empowerment is also a nebulous concept that carries with it many different interpretations and definitions. Rappaport considers empowerment as *"a belief in the power of people to be both the masters of their own fate and involved in the life of their several communities"* ([18], p. 142). Unlike this perception of empowerment as a belief [19], considers empowerment as a process seeking to nurture efficacy; *"enhancing feelings of self-efficacy among organizational members through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information"* (p. 474). Zimmerman also considers empowerment as a process that is characterized by the affordance of opportunities for people to control their own destiny and to influence the decisions that affect their lives [20]. Similarly, Lightfoot perceives the opportunistic facet of empowerment involving the affordance of opportunities people have for autonomy, responsibility, choice and authority [21]. According to Kieffer, not only should empowerment involve acquiring new practical skills, it should also involve individuals being afforded opportunities to reconstruct and deeply engrained personal systems of social relations [22].

Within an educational context, Ashcroft objects to words typically associated with definitions of empowerment such as "*motivating*", "*supporting*", "*freeing*" and "*enabling*" [8]. According to Ashcroft, "*motivating*" is solely the act of a teacher and as such, neglects the powers within the students themselves. "*Supporting*" infers weakness, inadequacy or impoverishment in students. "*Freeing*" suggests a directionless and laissez-faire teaching role while "*enabling*" does not tend to exude the potency and the positive impetus to action better which is characteristic to empowerment. In critically evaluating the concept of empowerment in education and its associated definitions, Ashcroft [8] purports that to empower is to *"nurture belief in capability and competence"* (p. 145) whereby capability refers to one's ability/capacity to act and competence refers to sufficient/appropriate/effective action. Therefore, according to Ashcroft, an

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empowered person is someone who believes in their ability/capacity to act in a sufficient/appropriate/effective manner.

5. Empowerment in schools

Just as power exists and functions in different ways in schools, both inside and outside the classroom, empowerment can also exist and function in different ways both inside and outside the classroom. However, much empowerment-based research that has taken place in an educational context has focused on the empowerment of teachers. With respect to teacher empowerment, it is conceptualized by Short, to manifest in six dimensions that includes; (i) decision making, (ii) teacher impact, (iii) teacher status, (iv) autonomy, (v) professional growth and (vi) teacher self-efficacy [23]. The decision making dimension of teacher empowerment relates to teachers' participation in making critical decisions that directly affects their work such as budgets, teacher selection, scheduling and curricula. The teacher impact dimension of teacher empowerment refers to teachers' perceptions that they have an influence on aspects of school life. Teachers' perceptions that their colleagues respect and admire them professionally are characteristic to the teacher status dimension of teacher empowerment. Teachers' beliefs that they can control aspects of school life such as scheduling, materials and instructional planning is characteristic to the autonomy dimension of teacher empowerment. The professional growth dimension refers to teachers' perceptions of the opportunities they are afforded by their institution to grow and develop professionally and enhance their skill set during a continuous learning endeavor. For teachers to believe that they have skills and ability to help students learn and that they can effectively instruct and compile programs that are successful in promoting student learning is characteristic to the teacher self-efficacy dimension of teacher empowerment [23]. Following on from this conceptualization of teacher empowerment, there has been considerable attention devoted to the exploration of various processes of teacher empowerment as well as investigating their impact on school life.

5.1. Processes of teacher empowerment

Apart from the characteristic dimensions of teacher empowerment, many have set out to describe processes that promote the empowerment of teachers. The affordance of decision making opportunities and promotion of increased responsibilities are factors that dominate conceptualizations of teacher empowerment processes. For example, Bolin considers teacher empowerment to involve *"Investing in teachers the right to participate in the determination of school goals and policies and the right to exercise professional judgment about the content of the curriculum and means of instruction"* ([24], p. 83). Similarly, Bredeson conceives teacher empowerment as *"a systematic process by which teachers would assume greater responsibility in their professional work life is rooted in a large body of research in the areas of participatory decision making, professional development, job enrichment, as well as in the areas of professional autonomy and teacher efficacy"* ([25], p. 2). According to Melenyzer, true teacher empowerment *"leads to increased professionalism as teachers assume responsibility for and an involvement in the decision making process"* ([26], p. 16). Perceiving empowerment as a process is also echoed by Short et al. who defines empowerment

as *"a process whereby school participants develop the competence to take charge of their own growth and resolve their own problems"* ([27], p. 38). Unlike these conceptualizations of teacher empowerment, Carl places the enhancement of students' learning experiences as a core function and outcome of teacher empowerment; *"Empowerment does not mean unrestrained and unstructured actions, but rather increasing the learning outcomes and other experiences which may flow from it, thereby contributing towards developing the learner's potential. A teaching environment within which teaching may occur optimally can only be created through effective empowerment"* ([28], p. xi).

5.2. The impact of teacher empowerment on school life

The impact of teacher empowerment can implicate school experiences for both teachers and students. The empowerment of teachers is linked to a number of desirable outcomes such as heightened teacher self-esteem [29] and job satisfaction [30–33] as well as enhanced organizational and professional commitment [32, 34, 35] and reduced dysfunctional resistance [36]. Teacher empowerment is also linked to enhanced middle school effectiveness [37] and the establishment of positive school climates [29]. Bogler and Somech [34] claims that principals should establish the conditions necessary for teachers to perceive their competency and status such as affording teachers with opportunities to grow professionally. However, Spreitzer [38] claims that individuals must be psychologically receptive if such empowering conditions are to be fully realized.

The impact of teacher empowerment on student learning is less than straight forward on the other hand. Although one study describes how teacher empowerment is a significant independent predictor of student achievement in standardized proficiency tests in reading and mathematics [37], two separate studies report no direct relationship between teacher empowerment and student academic achievement [39, 40]. According to the findings of Marks and Louis [39], the conditions that are necessary for teacher empowerment to positively influence student performance are understood to involve the affordance of decision making opportunities relating to teaching and learning decisions [37] in a professional teaching community that has collective responsibility for student learning [39]. It is conceived that teacher empowerment encourages teachers to improve how they teach, to instill a belief that student achievement is linked to their own teaching effort as well as promoting the communication and collaboration among teachers in exchanging of information about teaching effectiveness [39]. While considerable empowerment research that has taken place within the educational context has investigated the collective empowerment of teachers on an institutional level from external sources such as principals or board of management [37], less focus has investigated the empowerment of individual teachers [29, 35, 41] and even less attention has been devoted to investigating the empowerment of individual students.

6. Professional teacher knowledge for student empowerment

A crucial aspect of teachers' professional knowledge is perceiving and operationalizing their power in a manner that does not oppress or inhibit students' creativity, critical thinking or

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independent thought but rather, they use their power to empower students. Some important factors to consider towards the generation of empowering learning environments include the establishment of strong teacher-student rapports, developing a theoretically sound conceptualization of what it means "*to empower*" while setting out to promote equitable power dynamics in the classroom.

6.1. Empowering teacher-student rapports

A profound precursor to the generation of empowering learning environments is the establishment of strong rapports between individual teachers and individual students. According to Hattie's meta-analysis of what influences student achievement, what teacher's know, do and care is the greatest source of variance among differences in student achievement [42]. The relationship between a teacher and their student is considered to be an interpersonal relationship [43, 44] with students' relational goals and motives implicating this relationship [45, 46]. Among students' relational goals is the need for them to be liked by their teachers [45]. Teachers can help students to achieve these relational goals by ensuring students know they care for them. For students to develop an enhanced sense of empowerment, feeling cared for is vital. The extent to which a teacher cares for their students may be expressed by their immediacy, disclosure, assertiveness, responsiveness, and attractiveness [47]. Teachers need to be realizing just how important it is to express such behaviors given their influence on students' affective learning experiences, to the extent that their cognitive learning is enhanced [47]. Expressing care may be reciprocated, whereby the care that teachers express to their students is reflected in how students will care for their teacher. Providing strong rapports between individual teachers and individual students are established on a foundation of care, teachers can then begin to conceptualize and embrace what it means to empower.

6.2. Conceptualizing empowerment

6.2.1. Nurturing belief in capability

Following a comprehensive analysis of the concept of empowerment in education as well as a critique of stated definitions of empowerment, Ashcroft [8] encapsulates the fundamental pursuit of empowerment that is characterized by the nurture of *"belief in capability and competence"* (p. 145). A belief stems from personal knowledge or understandings that are antecedents of attitudes and subjective norms; they establish behavioral intentions [48, 49]. Elbow contends that *"Belief is the source of a child's power"* and new belief stems from success and the infusion of new power it brings for students [50]. Therefore, towards the nurture of student empowerment, teachers are challenged to instill a sense of belief in individual students of their ability/capacity to act in a sufficient/appropriate/effective manner. When seeking to nurture students' beliefs in their capabilities, teachers may firstly consider identifying the factors that suppress such beliefs. Once these factors have been identified, teachers should proceed to promote students' sense of efficacy in completing tasks which they may once have believed as being too complex. Overcoming such limiting pre-existing beliefs towards the positive advancement of students' personal efficacy may be achieved by issuing explicit and compelling feedback [51].

6.2.2. Transforming potential energy into human power

Ashcroft [8] portrays a useful analogy for teachers to assist in developing a conceptualization of empowerment. This analogy aligns human capability with potential energy while considering the Law of Conservation of Energy. According to the law of thermodynamics, energy can neither be created nor be destroyed, only transferred from one form to another. Therefore, it would infer that human capability, as potential energy, cannot be created or destroyed but it can be *"transformed, changed, altered, and developed into countless forms of human power"* ([8], p. 149). This analogy can inform the founding of empowerment philosophy of education for teachers, whereby the utmost purpose of their role in the life's of their students is to transform students' incredible and limitless potential energy into human power. Such human power will be different for each student. For some, it may manifest as the ignition of a passion or the development of new and enhanced confidence or sense of belonging. If the very premise of an empowerment process is *"to give power to"* ([17], p. 667), then, unleashing students' potential energy as human power is in essence, the act of student empowerment. Unleashing students' potential energy as human power is not necessarily restricted to learning that is characterized by the acquisition of new knowledge. As the saying goes, "*Knowledge is Power*", but learning to feel a sense of safety, security and belonging can also be a source of empowerment for students since *"Most young people alone can exercise little power… A student's power springs from the collective strength, talent, knowledge and dedication of all team members"* ([14], p. 185).

6.3. Promoting equitable power dynamics

The equitable use of power by teachers implicates intrapersonal student empowerment [52]. Teachers should be conscious of how power dynamics establishes in their classrooms and how they can embrace such dynamics to empower, as opposed to oppress students' creativity, independent, and critical thinking. Providing a safe space for students to voice their thoughts, ideas and opinions as well as including them in decision making processes pertaining to everyday classroom issues such as subject topics, coursework and classroom logistics can promote students to develop their own sense of empowerment as their individuality is recognized, listened to and valued. Students should be encouraged to develop a sense of responsibility and connectedness that comes from the teacher trusting them to make such contributions. Teachers should seek to emphasize the importance of students' contribution to everyday classroom life as well as the importance of the teachers' role in the lives of their students, while it may be assumed that it is primarily the role of the teacher to see to the generation of empowering learning environments in the classroom, it should be noted that students also play a role in the generation of such environments. Since, student behavior can influence the experiences of teachers [53], teachers need to also be conscious of how such behavior may have inherent implications to the teachers' efforts to promote the generation of empowering learning environments.

6.4. Empowering students to empower teachers

Ken Macrorie's "*Uptaught*" changed how writing was taught in America in the 1970's. Macrorie envisioned writing as a fundamental pursuit of human empowerment that teachers should seek to facilitate. Macrorie encouraged teachers to *"set up an arrangement which allows*

the majority of students in a class to find their own powers and to increase them. Making others powerful makes the teacher feel powerful. And the power of both is a fact" ([54], p. 88). Here it is explained how teachers' efforts to facilitate the empowerment of students may serve to indirectly empower teachers themselves. Therefore, a potentially potent means of developing an enhanced sense of teacher empowerment is through the embrace of the inherent ability and control that teachers have to empower individual students.

There is a tendency for descriptions of teacher empowerment processes to feature as a collective process involving all teachers that unfolds on an institutional level that is initiated and sustained by an external source such as principals or board of management. However, teachers may develop their own sense of empowerment by seeking to enhance the sense of empowerment experienced by their own students. Further, it is also important for teachers to consider how they can control and perceive the six dimensions of teacher empowerment as described by Short [23]. It may be assumed that the extent of which teachers believe they can make decisions, have an impact on school life, have status and autonomy as a teacher, to grow professionally or feel efficacious is dependent on external factors such as the influence of principals or boards of management. However, every teacher has the inherent power to make a decision about how they operationalize their power in the classroom. Every teacher has the inherent power to have a positive impact on the everyday school experiences of individual students. Every teacher has the inherent power to recognize and embrace their status as professionals with autonomy over how they act in the classroom. Every teacher has the inherent power to decide to grow professionally by creating or choosing to engage in professional development activities. Every teacher has the inherent power to feel efficacious in their abilities and capacities to unleash students' potential energy as human power as a function of their endeavors to empower their students.

7. When power and empowerment gets difficult

As nebulous and intricately complex concepts that have profound implications to the experiences of teachers and students, aspects and applications of power and empowerment can prove difficult for teachers. Contemplating the relinquishment of power, in any capacity, is a prospect that may be perceived as threatening to the status of an individual who has power. As aforementioned, it is desirable for teachers to embrace the banking model of education because in its fulfillment, teachers retain their power [16]. Teachers may hesitate to relinquish their power to empower students through the affordance of spaces for students to exercise creativity, independent thought and critical reflection of structures and norms that shapes their lives through a possible fear that their status or power may be undermined or questioned. Not only is the prospect of relinquishing power to students a potentially fearful prospect for teachers, but it also calls for those in power to be comfortable and flexible in a number of situations that deal with their expertise and authority [55]. For example, teachers need to be comfortable in appropriately addressing questions that students may ask them, responding to the development of students' critical thinking and dealing with students' developing understanding of how the wider society works to ultimately implicate every aspect of their lives. Within the context of the empowerment of teachers from a principal's point of view, principals may

hesitate to promote the empowerment of teachers as it may threaten their status and power. However, Gonzales and Short [12] refutes that the empowerment of teachers may threaten the status of principals claiming that empowering teachers will further teachers' recognition of the principals' expertise when in the process of promoting effective change.

Regardless of whether it is principals seeking to empower teachers or teachers seeking to empower students, the relinquishment of power demands critical thought, attention and time. However, it must be emphasized the full relinquishment of power might not always be possible. Certain hierarchies must be preserved within schools for their effective management. Principals must retain some power to make and enact on decisions made to see to the progress of the school. Similarly, teachers must retain some power to reward and prescribe behavior towards ensuring student growth. Achieving the establishment of equitable power dynamics that simultaneously negates oppression but nurtures the growth of every individual within schools is a vital component of teachers' professional knowledge. Principals and teachers must therefore be conscious of their power, to perceive how much power they could relinquish towards the empowerment of students but understand how much power they should retain in order to nurture growth.

8. Conclusion

Power works to shape the experiences of every individual within the school institution. Recognized as authoritative individuals with expert knowledge and expertise in the classroom, teachers assume power that can function to implicate their students' learning experiences. Teachers have a professional obligation to be conscious of the power that they assume in the classroom and how they operationalize this power. Without careful consideration of how they use their power, teachers may unknowingly oppress students, stifling their creativity and independent thought. Teachers must be encouraged to perceive their role and capacity to empower students by nurturing their sense of belief in their ability and capacity to act in a desired manner. In doing so, the act of student empowerment by teachers is perceived as an endeavor to unleash students' potential energy as human power. This human power will manifest differently in each individual student such as the ignition of a passion or the development of new and enhanced confidence or sense of belonging. While the relinquishment of power may be refuted by those who retain power as a means of preserving their power, teachers must be conscious of the consequences of how they use their power.

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Chapter 3

Curriculum Ideologies Reflecting Pre-Service Teachers' Stances toward Inclusive Education

Marita Mäkinen

Additional information is available at the end of the chapter

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Abstract

This chapter presents the results of the study of pre-service teachers' curriculum ideologies and what kind of belief stances about inclusive education they reflect. The chapter also provides insights into the steps the schools are taking toward inclusive school culture in Finland. The data were collected from 115 pre-service teachers in connection with two undergraduate study courses within the Primary School Teacher Education (PSTE) program. Their written reflections were interpreted through the lenses of curriculum ideology framework and inclusive education reform agenda. The findings reveal two types of tensions between pre-service teachers' curriculum ideologies: "knowledge versus experience" and "adoption versus reconstruction." These tensions reflect pre-service teachers' prerequisites for working in inclusive settings and ways to interpret the inclusive agenda stated by the international and national declarations. The results are discussed and suggestions are made for ways to enhance the implementation of inclusive education and develop teacher education.

Keywords: inclusive education, pre-service teachers, teacher education, curriculum ideologies

1. Introduction

In the current global educational movement, the term inclusion is not agreed upon. According to Kiuppis's [1] review of the UNESCO policies, the various definitions of inclusion seem to stem from the divide between the progress of "Inclusive Education" and "Education for All."

"Inclusive Education" originates from the Salamanca Statement [2], which is considered the starting point of a "new thinking" in special needs education. Since then, it has had a pivotal

role in the definition of educational international policies (e.g., [3]) and in the reforms of school curricula and guidelines of pedagogical practices of many countries, pushing the field of education to strengthen systems and develop support for children with special needs [1].

"Education for All," in turn, began in the social justice agenda and was introduced by the "World Conference on Education for All" in Jomtien in 1990; the idea behind this concept was a call for every child to have a right to a basic education. This agenda has strongly accelerated since the agreement of the "United Nations Convention on the Rights of Persons with Disabilities" [4]. Accordingly, inclusion has been accepted worldwide as a basic right and the foundation for an equal society. Furthermore, in many countries, the education systems have been reformed to reduce inequalities, develop teacher and system capabilities, encourage supportive learning environments, and develop high-quality support for vulnerable learners so that they can reach their potential (e.g., [5]). Although the idea of inclusion has been widely accepted, the global declarations espousing the ideals of inclusion rarely, if ever, mandate educational systems to establish inclusion.

In Finland, it has been corollary to agree with this "Education for All" philosophy because education has traditionally been perceived as a mechanism for enhancing social justice and equal educational opportunities for all students. However, the education system has maintained the "twin-track model" of labeling "exceptional" the individualized instruction, accommodations, and support most appropriate for their students before they are entitled to receive needs within special education settings.

The ongoing change started within the Special Education Strategy [6], which launched the updating of the legislation [7] and the National Core Curriculum [8] to be in line with the Salamanca Statement [2]. Since then, student diversity in mainstream settings has been rebuilt on the instructional "three-tier support model." The support consists of three steps: general, intensified, and special support. In addition, multicultural approaches are topical in Finland, entailing educational strategies that incorporate previously marginalized ethnic groups into the curriculum. The most recent National Core Curriculum [9], which has been implemented in schools since August 2016, relies on an inclusive principle in its underlining of student participation and requiring the meaningfulness of learning, making it possible for every student to experience success, as stated in the following:

> The development of basic education is guided by the inclusion principle. The accessibility of education must be ensured. This means supporting the pupils' learning, development and well-being in cooperation with the homes. Basic education offers the pupils possibilities for versatile development of their competence. It reinforces the pupils' positive identity as human beings, learners and community members. Education promotes participation, a sustainable way of living and growth as a member of a democratic society. Basic education educates the pupils to know, respect and defend human rights. The social task of basic education is to promote equity, equality and justice. ([9], p. 18).

As the excerpt indicates, Finland has adopted the UNESCO [10] policy guidelines that combine both notions of inclusion by understanding inclusion as a "process aimed to offering

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quality education for all while respecting diversity and the` different needs and abilities, characteristics and learning expectations of the students and communities, eliminating all forms of discrimination" (p. 18).

However, the discrepancies between these two inclusion approaches have given rise to pedagogical confusion for teachers regarding how to interpret the NCC's [9] agenda and apply inclusive pedagogies. Pedagogical concerns have also been caused by the fact that the "inclusive principle" includes a twofold demand for teachers: inclusive pedagogy should address the individual learning needs of students (cf. [11, 12]), and it should include all students who face barriers to full participation in learning (cf. [13]).

As discussed earlier, the reforms of putting inclusion into the curriculum are interlaced and presently highly debatable concepts in terms of enhancing the quality of teaching for all. Teachers especially feel confused because they are viewed as having the most direct impact on the day-to-day educational experiences of students in inclusive classrooms. They are responsible for encountering and treating all students equally, regardless of their [dis]abilities, social class, ethnicity, religion, or gender, as stated in the NCC [9]. At its heart, inclusion involves teachers' commitment to the values of equity, equality, and participation.

Hence, teachers' set of beliefs in a situation where they are expected to implement new curriculum agenda and practices are crucially important for the success of the reform (cf. [14–16]). Therefore, if the attitudes and beliefs of teachers are not considered, especially when a radical change is in progress, more resistance from the teachers' side will be experienced (cf. [17]), and the commitment to change will be limited [15, 18]. As Schubert [19] has noted, curriculum is the practical application of a teacher's personal beliefs. That is to say, teachers' beliefs give meaning to their curriculum, and their instructional endeavors reflect their curriculum ideology [20, 21].

For the current study, the curriculum reform in Finland serves as an impetus for exploring how pre-service teachers have understood and interpret the inclusive principle stated in the NCC [9]. The meaning of considering pre-service teachers is derived from the fact that they are regarded as change agents because of the updated knowledge that they have recently acquired. Furthermore, signals of confusion among the teachers, as shown in Haines et al. [24], signals the need to collect data from teachers to identify their set of beliefs and what kinds of curriculum ideologies they hold. The results are critical for enhancing the successful implementation of the inclusion principle, as well as developing teacher education.

This chapter also presents insights into the steps the schools in Finland are taking toward inclusive school culture, which is examined and interpreted through the lens of pre-service teachers. Therefore, in the chapter, I present the results of the study and address the following questions:

- What are the curriculum ideologies of pre-service teachers participating in the teacher education program?
- What kind of stances about inclusive education do these reflections represent?

2. Curriculum ideologies

According to Schiro [20, 21], a curriculum ideology is a practical philosophy that influences a teacher's day-to-day behaviors toward curriculum issues. However, other scholars use the phrase curriculum orientation (e.g., [14, 19, 22, 23]). In the current study, I draw on Schiro's [20, 21] framework, in which the beliefs about the purpose of curriculum (education) are divided into four distinctive ideologies: the *scholar academic*, the *social efficiency*, the *learner-centered* (child study), and the *social reconstruction* ideology.

The scholar academic ideology is concerned with maintaining "cultural literacy" by having students study the content and modes of inquiry of traditional academic subjects. The social efficiency ideology aims at efficiently carrying out a task for society, providing knowledge and skills that give students the ability to function in society. The learner-centered ideology places the student in the center of the educational endeavor and is concerned with helping each student grow into a unique individual who has a healthy self-concept. The social reconstruction ideology attempts to help students understand the crises facing society, develop a value stance toward those crises, and learn how to act to relieve the crises, thereby bringing into existence a better society [20, 21].

According to Schiro [20, 21], these ideologies are roughly parallel to the academic, vocational, personal, and social goals for education. Each curriculum ideology is more akin to a pedagogical subculture than to a goal; each has an impact on teachers' thinking about the nature of knowledge, the curriculum intent (aims, goals, and learning objectives), teaching strategies, learning, students, and evaluation methods (e.g., [19–21, 25, 26]). They also affect students because the underlying values and beliefs of each ideology not only influence what is taught but also how and why it is taught [20, 27]. It has also been shown that curriculum ideologies play an important role in the success of any reform movement [25].

3. Research site and methods

In connection with two undergraduate courses entitled "Inclusive Education" and "Teaching Practicum," the current study was conducted at a multidisciplinary research university within the Primary School Teacher Education (PSTE) program in Finland. All participants were enrolled in both courses. The participants were 115 pre-service teachers who were completing their teacher qualification for primary school. The "Inclusive Education" course focused on discussing the theoretical underpinnings of student diversity (such as language, abilities, background, religion, and gender) and the current instructional support system as a means of enhancing inclusive school culture. The students were encouraged to work in small teams to construct a shared understanding and build new ideas of how to enhance inclusion in daily school curriculum.

In addition, the course included a week-long field experiment that asked students to visit one school community and find out how the inclusion principle was implemented in accordance with the NCC [9]. They were encouraged to observe the school community and classroom practices, conduct interviews with the in-service teachers, special needs teachers, school

principals, and welfare staff, take part in teacher meetings, and so forth. The students also wrote reflective journals based on the coursework and field experiments. They were challenged to express their beliefs, attentions, and values on what had caught their attention relating to the ongoing reform.

The data from the "Teaching Practicum" were collected through the pre-service teachers' written narrative reflections, which allowed them to examine their lived experiences, biases, and assumptions about teaching. These two types of writings provided a window through which to understand the essence of the pre-service experience of teaching in inclusive settings. The data set thus comprised 230 reflective texts written during and after these two courses. Participants were numbered 1–115 with an acronym PRE, which refers to reflective journals, and a different acronym PRAC, which refers to narrative reflections.

Through the content analysis (cf. [28]), it was possible to articulate variations of students' meaning making and varied ways of experiencing and interpreting their curriculum ideologies from the perspective of inclusive reform. The meaning unit was determined as either a complete description of an individual's lived experience or a brief notional statement called an "episode." Thereafter, I divided the episodes into topics, which consisted of repetitive reflections that emerged through several readings of the data. The topics were then classified and reduced into themes. Finally, six main themes emerged to describe the pre-service teachers' belief stances toward inclusive education (reported elsewhere). However, in this chapter, I do not follow the study analysis as such but rather examine the data from the perspective of thinking with theory [29], which method uses the data to think with, and use theory to think about the data. I interpreted the data through the lens of Schiro's [20, 21] framework by connecting the data and the curriculum ideologies to each other from the perspective of inclusive reform.

The analysis of thinking with theory revealed two main tensions between pre-service teachers' curriculum ideologies [20], namely "knowledge versus experience" between the scholar academic and learner-centered ideology and the "adoption versus reconstruction" between the social efficiency and social reconstruction ideology. I picked crucial episodes that serve as examples of how the pre-service teachers interpreted the inclusive reform and what types of curriculum ideology they reflect. In this way, I was able to highlight the teachers' belief stances and prerequisites for working in inclusive settings and ways to interpret the NCC's [9] inclusive agenda.

4. Knowledge versus experience

Although the basis of scholarly academic ideology rests on the belief that acquiring an understanding of academic knowledge involves learning the content knowledge and ways of thinking [20], the learner-centered ideology focus is solely on the student. The student's educational needs and interests are central to learning and must be incorporated in the learning experience. In the following, two pre-service teachers make meaning and reflect on their experiences of the teaching practicum. The former episode refers to a scholarly academic ideology and the latter one to a learner-centered ideology:

> *It is not enough that you have understood and your pupils have understood the subject matter; rather everyone should even understand the same matter by the same time and in addition together. (…) I have been wondering, indeed, how I know my subject matter of school so badly. I must concentrate on using the right terms. I fail even with my well-practiced demonstrations. My authority feels insufficient. If the students take the upper hand, it all ends up in chaos. The problem with questions is that you prepare a new topic with questions, that you ask children questions about things they cannot have enough information about. (…) My personal opinion is that it is the teacher's task to teach.* (PRAC 89).

> *A successful moment is when students are eager to learn new things and feel encouraged to use their new skills (…) when we experience a moment of flow together, when we experience joy and freedom. There was a kind of positive atmosphere in the classroom. I listened and gave them opportunities, and then I felt that I created security in a way that nobody laughed at anybody no matter what they said. It's important to stay positive.*

> *All learning seems to be based on interaction (…) only in interaction first with another person and later with other persons will students get a mirror to look in and a frame in which he or she can develop.* (PRAC 08).

The episodes above illustrate the tension between knowledge and experience, which occurs between the traditional curriculum, developed to guide students on how to acquire knowledge and solve problems, and the learner-centered curriculum, advocated by constructivism as a way to emphasize an individual's activity and learning experience.

According to scholarly academic ideology, the meaning of knowledge is its ability to contribute to the extension of the academic discipline (cf. [20]). Thus, the subject matter is determined and selected from the knowledge bases of disciplines, such as biology or physics, by "specialist scholars" who are expected to bring down this knowledge to teachers and students. The impact on teachers is that they should also be specialists in the disciplines being taught, keeping the hierarchy between scholars at the top and students at the base.

In turn, the main idea of the learner-centered ideology is that learning is seen as an active process driven by the interest of the individual student. Schiro [20] exemplified the distinction to the previous ideology as "I have experienced" is more important than "I know," that is, the first-hand experience of reality is more important than the second-hand experience gained through a textbook. Curriculum is designed in line with Piagetian ideas about the stages of development, assuming that the construction of the learning process should be in harmony with students' cognitive stages (cf. [30, 31]). The impact on the teachers is that they are seen as facilitators of the discussion, debate, and interaction between students and their learning environment.

Although scholarly academic ideology prefers teaching methods such as Socratic questioning, didactic discussion and supervised practice, for the learner-centered ideologist, teaching is to be adapted to the individual student, and the student's authentic activity is seen as a prerequisite for education [20]. These distinctions between the stances on teaching are crucial in terms of inclusive education. The following episodes demonstrate two contrasting ways pre-service teachers observed and formed an attitude regarding the activities in the inclusive classroom. The first episode echoes scholarly academic ideology, even though the participant attempted to recognize the individual students, while the latter one refers to more learner-centered ideology:

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There was a one student labeled as receiving intensified support in the Finnish class. This student sat in front of the classroom, in the middle of two other students. The lesson proceeded through a common conversation into the writing task. The task was made independently. Most of the teacher's time was spent in assisting that one 'intensified support' receiving student. Writing was not easy for him, and he needed the teacher's help frequently. So, the teacher had to go through the text word by word with him. When assisting that student all the time, the teacher did not have any time to go around the class during the performance of the assignment. She shouted the instructions to other students while sitting beside the demanding student, and the instructions were essentially to ensure that the class was disciplined, and all behaved in an appropriate manner. The demanding student suffered from the situation as well as the class that remained ignored by the teacher (PRE 26).

Some of us have obstacles that require more than normal enterprise and assistance, but despite that diversity is not an obstacle to moving forward or working together. This observation raised strongly during the field work. I looked at that so-called tomboy in the class, and I admired his way to see the world, in that case, the class, differently. I wondered, what kind of things he saw and felt. He was not cynical at all. I noticed that shared values were more important for him than the values of the individual. He gave his attention with a smile to the student sitting next to him, although he himself was in turbulent. He was empathic! I understood that the way how we usually differentiate learning and try to slick down these students' learning paths by taken them away from the mainstream classes, is not the way I believe in. (PRE 101).

The above episode refers to the preference of viewing the subject matter as the most valued property, which must be delivered to the students; as Schiro [20] stated, the curriculum is intended to acculturate children into a discipline. This inclination made pre-service teachers concerned about how they should accomplish goals regardless of the imbalance between mastering the subject matter and managing the classroom (cf. [32]). In turn, the latter episode illustrates that such a learner-centered ideology has the learning process as an end in itself. The view differs from an educational policy-driven paradigm of student centrality that emphasizes that curriculum should be characterized by "learning outcomes" describing the measurable skills or abilities that students should be able to do or demonstrate as a result of learning (e.g., [33]).

This returns to a question about the focus of learning: should we pay attention to generic skills capacities instead of a detailed specification of content knowledge? Wheelahan [34] raised the view about the "crisis of curriculum," arguing that the worldwide education policy drives toward stripping knowledge out of the curriculum due to the shift in learning outcomes (cf. [34, 35]). But then, the current knowledge society and information overload within the explosion of digital technologies raise a critical question about the changing nature of knowledge and children's life worlds, meaning making, and learning as a whole. Accordingly, this leads to the question of which one is more valuable: the subject matter or generic skills. For example, there is literacy, which guarantees equal access to the most powerful forms of knowledge; literacy is crucial because it allows learners to gain these basic skills and builds students' discipline-specific understanding of how texts represent both the knowledge and the ways of knowing, doing, and believing in different disciplinary communities (cf. [36, 37]). Hence, the subject matter and generic skills are two sides of the same coin and should not be separated from each other.

5. Adoption versus reconstruction

Unlike the two previous curriculum ideologies, instead of focusing on individual learning, the ideologies of social efficiency and social reconstruction perceive learning as a social process. However, although the social efficiency ideology states that the initial aim of learning is to meet the acute needs of the society, the social reconstruction ideology makes use of the social process to develop students' abilities to analyze and understand society, creating solutions and a vision for a better society. The next reflective episodes exemplify the pre-service teachers' reflections on the challenges toward schooling to respond to the multiple demands of a society. The first talk brings up the social efficiency ideology, and the next one refers to social reconstruction ideology:

> *I recognize the growing demands everywhere. I should increase media literacy and use ICT devices to meet today's challenges, I should support the students to identify their feelings and support them to work on them, and so on. I am expected to bring the PISA success back to the top, etc. That sounds pretty unreasonable. Not to mention inclusive teaching. I look forward to the new core curriculum to bring improvement to this situation. However, it should not be forgotten that the school is not the only place, where to turn over a new leaf of children's lives.* (PRAC 12).

> *The most unforgettable teaching experience was the idea that came to my mind suddenly in the history lesson. I turned off the classrooms lights and lighted some candles. I asked the students to put our souls into some refugee's soul who had been traveling in a sinking boat in the Mediterranean Sea. We had to try to think what the person felt when the boat was sinking. It was a very quiet moment. Then I asked the students what they had been thinking. One of the students, for example, told that she had been thinking a child who had been saved. This child had been crawling on the broadside of the boat and she had seen through the window another person who was inside the boat looking through window and praying. Altogether that particular moment in our classroom was beautiful and rich in atmosphere. I think that this kind of moments and situations felt like the most important matters in the school. Schools mission is not to fulfill child with information as efficiently as possible, but recognize the injustice of the world and find ways to make the world a better place to live.* (PRAC 51).

The above episode depicts the social efficiency belief, according to which the meaning of skills and knowledge is to create a solid base of the abilities needed to function in society. Thus, the first milestone is to determine the needs of society, as one of the pre-service teachers tried earlier. The next step is to develop a curriculum that meets the determined needs. In contrast, the latter episode reflects the idea of the social reconstruction ideology that assumes that there is no such thing as an absolute knowledge or skill needed to survive in society. Many pre-service teachers parsed learning, like in the learner-centered ideology, as a process. The episode shows how they attempted to incorporate learning experience with current social issues, as in the above episode illustrating how to be sympathetic and understand the refugees' feelings under their dangerous conditions.

In terms of inclusive education, the social efficacy ideology is quite demanding for teachers. Teachers are expected to find the most efficient teaching methods for delivering the knowledge and skills to the students with the aim of producing "educated people" who achieve the

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objectives and thus fulfill the needs of society (cf. [20]). The social reconstruction ideology, in turn, has such an impact on teachers that they are expected to provide students with learning experiences that can develop their critical analytical skills and stimulate them so that they can contribute to the reconstruction of society [20, 38]. Therefore, the necessary knowledge does not exist in books, but rather, it lies within the knowers in the meaning that the person gives to the words and experiences.

According to the social efficiency ideology, teachers are placed in the center to control everything in the classroom, and the students are perceived as "raw materials" to be shaped. This may lead to teacher-led instruction methods because of assuming that the teacher's job is to decide what students are expected to learn, why they are learning it, how they are supposed to learn it, and what books they will be reading. This seems to be an overwhelming claim for a teacher in heterogeneous groups of inclusive settings. In turn, because, for social reconstruction ideologists, teaching is more collaborative, the development of an inclusive pedagogy is more possible. This is because social reconstruction ideologists appreciate group discussions for joint learning and developing solutions for existing problems [20]. The following episodes reflect two contrasting ways pre-service teachers reflected on experiences of inclusive classrooms. The first episode echoes the social efficiency ideology and the latter one the social reconstruction ideology:

> *Our current school system has worked well as we have been recognized as the PISA success country etc. In the future, we want to continue to be among the leading countries in education. In order to be able to continue in the top of the world, and to be highly valued in the field of education, we will need new innovations in our schools. School practices should constantly keep on evaluating, in order to be able to meet the needs of society. Many experts and politicians, including the Ministry of Education, have emphasized the importance of adding information and communication technology as a medicine to our bad Pisa success.* (PRE 38).

> *The class talked about the refugees in Finland. Some of the students suggested that we have understand that each of their lives was unique. They knew that some had come to Finland as babies, others as children, and others encountered cruelty at home, others were struggling with bad feelings. Each of them was different, but together. I was different with them, and in that one room, in those hours, I understood about inclusive education more than ever before in my life. Inclusion is not limited to one category of people or age group, it is a conceptual model for the whole school and for better society. All children are able to learn, and the greatest benefit comes from collaboration, learning together. Diversity is valuable, and the sense of communality is emphasized in the fact that student diversity is seen as a positive resource for that school, but also for society, and everyone can get involved.* (PRE17).

The episodes refer to the current situation in Finland, indicating the tension between the social efficiency ideology and social reconstruction ideology. The discrepancy has occurred, for example, because of the Program for International Student Assessment (PISA) achievement program (e.g., [39–41]). The success has created tension in schools—concurrently with the inclusive reform—to reproduce the result by raising the effectiveness of schooling by extending both the requirements of knowledge content and demands for academic achievement in the NCC [9]. Social efficiency drivers have laid pressure on moving toward standardization and test-based accountability along with the inclusive agenda. This twofold pressure is conveyed in the pre-service teachers' narrative journals.

The latter episode mentioned earlier refers again to the debate concerning the integration of refugees in Europe. In addition, the episode depicts the inclusive shift through one of the pre-service teacher's reflections, referring to the social reconstruction curriculum ideology. In all, the pre-service teachers seemed to observe sensitively, in particular, in the collaborative environments in school communities, and they desired tangible collaboration and team teaching. Furthermore, they appreciated the idea that they could learn from their own and others' experiences through active reflection on their actions and their consequences (cf. [42]). They valued the partnership model [43] to boost their professional learning through close and supportive relationships with colleagues, which was also a prerequisite for their favorable belief of the inclusive shift in schools.

6. Discussion

Through the lens of curriculum ideologies, the findings reflect some aspects that are useful to note when implementing inclusive practices in schools, as well as for creating future directions for teacher education. First, it has become important to understand prospective teachers' own conceptualizations and set of beliefs of how to make meaning of the reform agenda, which aims to support learning and respond to students' diversity in inclusive settings. Schiro's [20] framework served an indirect channel to explore pre-service teachers' reflections of uncertainties and possible fears. Allowing for questioning may encourage teachers to transform their curriculum insights into new situations and gain understanding of unpredictable circumstances in school settings (cf. [44]).

Moreover, the notion of inclusion represented a scheme into which they could mirror their beliefs, values, and attitudes toward their future teaching careers. According to the data, the beliefs on inclusion occurred as a complex macro-level societal phenomenon that was in conflict not only with the demands to fulfill the needs of "normal students" but also the current needs of society. Another inconsistency they felt concerned the prevailing school cultures; the inclusive reform represented a risk: it may both shake the prevailing school cultures and professional practices, and the reform itself was at risk of being drowned out in the prevailing school cultures.

Accordingly, the results indicate that the notions of adoption and adaptation, introduced by Hewitt [45], are relevant when considering the tensions emerging from the data. Hewitt [45] defined adoption and adaptation as the approaches of teachers in curriculum implementation. In line with social efficiency beliefs, adoption refers to a top-down assumption that changes required by society should be applied with a linear implementation by the teacher of the curriculum, which is designed by external specialists and politicians. In contrast, adaptation, such as social reconstruction ideology, refers to the fact that curriculum reform movements should be made in collaboration with real implementers by classroom-level specialists. This necessitates continuous negotiations and flexibility between the politicians, designers, and implementers of the curriculum (cf. [46, 47]).

This dialog could create an arena for joint understanding about the societal circumstances in which the theoretical and practical knowledge are taken into account and where the societal approach to learning is considered. In doing so, it promotes a vision of a better society in which the problems and conflicts could be resolved, and the society can be developed.

However, there is a risk that if the social efficiency ideologists shift their terminal objectives to raising academic standards, they also may shift their ideology from social to academic, despite escaping from the scholarly academic emphasis on more learner-centered education. This is critical, for example, in Finland, where the education system seems to be at a turning point regarding what path it may take. As of yet, fortunately, Finland has not chosen a high-stakes testing policy as most countries have but is looking for a new way [48–50]. To keep in line with the social justice philosophy and the "Education for All" agenda, it is important to give up straightforwardly confronting the beliefs beyond the different curriculum ideologies. Instead, the school-based curriculum ideology could offer a bottom-up approach that considers students, parents, and stakeholders, as well as incorporates the best parts of the ideologies to enhance student-driven social justice curriculum.

As Dewey [51] criticized how the academic knowledge of education has developed standards that promote "docility, receptivity and obedience" (p. 18) among students, while teachers are turned to be agents who transmit knowledge and skills and enforce rules of conduct. This is, according to Dewey, one of imposition from above and outside, creating a gulf between school and students (cf. [52]). In turn, the teachers' essential task should be to bridge the gap between students' prior knowledge and experiences and appropriate content knowledge, gaining students' individual experiences of their surrounding environment and using this to understand, analyzes, and improve the society around them.

Consequently, in conjunction with Bandura's [53] views, the data of the current study indicated that social reconstructive ideology could contribute to creating sustainable "collective efficacy" in developing inclusive school cultures. This means that by focusing on "collective efficacy" while teaching practicum in an inclusive setting, the pre-service teachers need to draw attention to educational inequalities and search for solutions that promote a just education for all.

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Chapter 4

Facilitation of Teachers' Professional Development through Principals' Instructional Supervision and Teachers' Knowledge-Management Behaviors

Chien-Chin Chen

Additional information is available at the end of the chapter

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Abstract

With the rise of global competition and the focus on teacher quality, teacher professional development is becoming increasingly crucial, and the stress and challenges for principals are more severe than ever. Teachers can improve their professional abilities through principals' instructional supervision and their own knowledge-management (KM) behaviors to benefit students. Thus, this chapter analyzes the relationship among principals' instructional supervision, teachers' KM, and teachers' professional development. The author believes that principals' instructional supervision and effective KM can facilitate the professional development of teachers. The author also believes the readers can know the relationships among them, and teachers' professional development can be improved through principal's instructional supervision and teachers' KM behaviors.

Keywords: instructional supervision, knowledge-management behaviors, professional development

1. Introduction

The decreasing number of students and increasing accountability to the public challenge the sustainable development of schools. Schools must provide quality education to attract students and maintain their brand. For sustainable development, leaders are expected to strengthen the professional competency of teachers and staff, formulate strategic plans, and build collaborative relationships with external parties to manage change [1].

Principals, as instructional leaders, are primarily responsible for promoting effective teaching implementation [2]. Effective principals continually engage teachers in instructional dialog and reflective practices to ensure that they are thoroughly equipped to improve student performance. Effective principals are aware of the varied instructional strategies that directly or indirectly improve teachers' professional development [3].

The relationship between a principal's instructional supervision and a teacher's professional development is of interest to the study of teachers' professional development. Research indicates that principals not only play administrative roles but also instruct teachers. In particular, principals inspire teachers to overcome challenges and changes in education. Principals who are school leaders should consider the influence of teachers' instructional behaviors while emphasizing their own roles in instructional supervision. To positively affect teachers' quality, principals must engage teachers in ways that support improved practice and seek to empower teachers as creative and innovative [4].

In the knowledge-society era, knowledge management (KM) has become a primary strategy for improving a school's competitiveness and a reference for teachers' professional knowledge [4, 5]. If teachers can get useful feedback from principals' supervision of their instruction, they can implement KM behaviors into their professional development. Effective organization, storage, sharing, and leveraging of knowledge can propel teachers to become more adaptive, innovative, and intelligent. Research has shown that the sharing of knowledge among teachers can predict teachers' professional development. Principal instructional supervision can directly influence teachers' professional development; knowledge sharing can mediate this effect and indirectly improve teachers' professional development. In other words, if teachers can share their knowledge with other teachers, they can improve their professional development through the process. If teachers properly apply KM and the principal's opinions to their teaching, they can improve their self-understanding and professional abilities [6].

This chapter discusses the principal's use of instructional supervision to improve teachers' professional development. In the process, the author questions whether teachers' KM behaviors facilitate teacher development. Therefore, the author collects related literature and find the connections among these variables. Next, the conceptual framework for studying the effects was drawn to confirm the connections among these variables. Finally, four steps for principal to improve teachers' professional development were concluded. The author believes the readers can know the relationships among them, and teachers' professional development can be improved through principal's instructional supervision and teachers' KM behaviors.

2. Literature review

2.1. Instructional supervision

Instructional supervision is a type of educational supervision. In Taiwan, we recently piloted the principal's classroom walkthrough (CWT) and classroom lesson observation to test the possibilities of the principal's instructional supervision. CWT and classroom observation are

important for curriculum development and instructional supervision. CWT and classroom lesson observation enable quick and systematic collection of information to demonstrate the principal's emphases on curriculum and teaching. The benefits in CWT and classroom observation are: (1) administrators become more familiar with the school's curriculum and teachers' instructional practices; (2) administrators can examine the climate of a school; (3) a team atmosphere develops as teachers and administrators examine instruction and student motivation and achievement; (4) administrators establish themselves as campus leaders and instructional mentors, influencing teaching, learning, and ongoing school renewal; and (5) students see that both administrators and teachers value and observe instruction and learning [6].

These concepts differ from the concept of circumambulating the hall in that the principal or director enters the classroom unannounced to observe teachers' instruction. Each observation is aimed at monitoring a teacher's classroom management and does not exceed 10 min. Although some have argued that CWT is just brief, but frequent, classroom visits, CWT is informal observations that allow principals to gather, analyze, or confirm the teaching messages from many teachers in a short period [7].

Principals' instructional supervision focuses primarily on helping teachers reflect on their actions and promoting school improvement through professional development [8]. Instructional supervision is based on school-based supervision from relevant staff (principals, administrators, teachers, and inspectors) in schools to provide supervision, support, and continuity assessment for teachers' professional development and improvement of the teaching process. Instructional supervision enhances teachers' professional knowledge and promotes the effectiveness of teaching activities [9]. The aims of instructional supervision are as follows: (1) to provide objective feedback to teachers; (2) to diagnose and solve teaching problems; (3) to help teachers develop their strategies and skills; (4) to evaluate teachers for promotions or appointments; and (5) to help teachers maintain a positive attitude [10].

This chapter discusses Glickman, Gordon, and Ross-Gordon's (2001) framework of instructional supervision. They concluded principals' five supervisory tasks are as follows: direct assistance, group development, professional development, curriculum development, and action research. They viewed instructional supervision as enabling teachers to improve students' instruction and improve relationships, meeting both organizational and personal needs. Their findings are comprehensive with respect to the specific instructional tasks that integrate teachers' needs and school goals [11].

Direct assistance is the provision of personal, ongoing contact with an individual teacher to observe and assist in classroom instruction [12]. It is designed to help teachers improve instruction through CWT, classroom lesson observations, and reflective dialog; moreover, it has been shown to be crucial to the development of both teachers and schools [4, 6]. Through formal and informal interaction, principals attempt to improve teachers' instructional practices. The purpose of the process is to help teachers reflect on their instruction for self-improvement [6].

Group development is the gathering of teachers to make decisions on mutual instructional issues. The principal has a decisive influence on the practice of school curriculum and is the leader in instruction. If the principal promotes a positive attitude in teachers, instructional

supervision is more effective. If the principal wants teachers to participate in instructional supervision, they must enable the teachers to have a positive outlook on instructional supervision. The principal should create teaching groups, and let teachers learn together [4, 12]. The purpose of group development, as a dimension of instructional supervision, is to support teachers working cooperatively, rather than alone or competitively [13]. Among other things, group work is designed to develop communication, decision-making, and problem-solving abilities. Recently, teachers' roles have been defined as collegial, collaborative, and oriented toward professional community [12].

Professional development includes the learning opportunities for faculty provided or supported by school members. Professional development is the continuous education of educators to improve the quality of education in a school. Professional development concerns these issues: (1) controversies associated with preservice preparation and the political dynamics of teachers' nascent careers; (2) problems with contrived forms of collegiality, in contrast to effective mentoring and peer coaching in the context of shifting power relationships between principals and teachers; (3) political strategies principals use to empower teachers; and (4) the use of teacher influence to comply with and resist the imposition of administrators' dictates [11, 12].

Curriculum development is the revision and modification of the content, plans, and materials of classroom instruction. Curriculum development is the collective selection by educators of curriculum purpose, content, organization, and format that are appropriate to students' needs. It is supportive of teachers' choices, which improves commitment to curriculum implementation [11]. Principals in Taiwan assist teachers through workshops with curricula to develop instructional competence [4].

Action research is the systematic study of classroom and school activity with the aim of improving teachers' learning. Action research is school/class or individual level instructional improvement whereby educators conduct studies of the results of their activities [11].

Instructional supervision, as a teaching and learning improvement strategy, should be a continuous assessment tool that allows teachers to continually expand their capacity to learn and to help others. A more effective method to promote learning is to help those who work with students to become more knowledgeable, skillful, resourceful, flexible, creative, and sensitive to the needs of students [11]. As stakeholders in curriculum implementation, teachers should be at the forefront in the instructional-supervision planning process from the outset. If teachers view supervision as something done to them and for them but not with them, its potential to improve schools cannot be fully realized. Research also emphasizes the need for teachers to play an active role in instructional supervision. When teachers perceive purpose, control, and personal responsibility, they function more as originators rather than as executors [8]. Instructional supervision should allow competent teachers to explore new methods of improving their professional development and the apprehension of their classes [14].

Supervisors are not the sole contributors to the improvement of education. The principal, for example, is not more expert in teaching methodologies than teachers who know the abilities and inabilities of their own classes and students. Teachers should not be required simply to defer to the supervisor regarding the instructional-supervision process [6].

The instructional-supervision process should include preobservation and postobservation discussions between the supervisor and the supervisee. These can promote teamwork and relationships among staff and management and create an environment of mutual trust, thereby facilitating a frank exchange of ideas between different teaching groups. Such a relationship can provide a relaxed and supportive environment where teachers have freedom of expression to psychologically prepare their students for the presence of a third party (supervisor) in their class.

The key factor to instructional supervision is principal's role. First of all, the author should let teachers understand what is instructional supervision and its relevant meanings. Secondly, principal should establish a friendly working environment and let teachers hold positive and positive attitude to instructional supervision. Finally, set the instructional supervision schedule into school calendar. By doing so, teachers can feel principal's attention. With the purpose of professional development of teachers, even through peer supervision, teachers can be given the responsibility to reduce their stress so as to enable teachers to conduct professional discussions and enhance teachers' teaching effectiveness.

2.2. Knowledge management

KM is a predominant knowledge-based approach in Taiwanese education and considers scientific knowledge as intellectual wealth. Therefore, knowledge accumulation through memorization of theory and facts for reproduction is essential for Taiwanese students. Pedagogical studies emphasize knowledge absorption. KM was introduced in the 1990s after the development of the knowledge economy. It refers to a multidisciplinary approach of achieving a school's objectives through the effective use of knowledge. Researchers have recognized the value of KM in education [5].

The Institute for the Study of Knowledge Management in Education (ISKME) was founded in 2003 in the United States. The ISKME conducts applied research to more effectively understand how educational institutions can create environments and infrastructures that maximize knowledge across all levels of an organization. The ISKME assists schools in improving their use of information technology and in otherwise identifying, distilling, and harnessing information. The ISKME also advises institutional leaders and educational organizations on the development of strategic initiatives, policies, and practices (ISKME-Knowledge Management Web-sites, http://www.iskme.org/).

The majority of studies have shown that knowledge can be classified as either tacit or explicit [5]. Tacit knowledge is experience-based knowledge specific to an individual, whereas explicit knowledge is precise, formally articulated, and documented. In organizations, knowledge is often embedded in repositories, documents, routines, operational processes, practices, and norms. The practices of KM are particularly promising and appropriate for elementary schools. The democratization of data and the sharing of information induce people at every level to contribute, participate, interact, grow, and learn while mastering higher-order skill sets. KM can help benchmark progress and constantly improve educational quality. Therefore, KM can benefit schools and teachers.

Because the definition of KM within education varies, the author must distinguish the following concepts: KM as a strategy focused on corporate objectives, such as continuous improved performance [5]; KM as a process of retrieval, sharing, utilization, storage, and generation of knowledge based on the knowledge life cycle [15, 16].

Knowledge retrieval is the collection of knowledge for planning, decision-making, and problem-solving. It involves capturing existing knowledge through its formalized representation and acquiring needed knowledge and information. For teachers, it is the process of accessing knowledge from an external environment [16].

Knowledge sharing is the extent to which people share their knowledge and experience. Knowledge sharing involves the knowledge flow from one community to another and the transmission of organizational knowledge to those who need it [4]. All implicit or explicit teacher knowledge must be circulated and transmitted through relevant pipelines to form a team's working rules; and KM can help with this process. Through the diffusion of knowledge, explicit knowledge stored in the database and tacit knowledge in the minds of the depositors can be shared [5].

Knowledge utilization is the extent to which teachers apply knowledge to make decisions, take informed action, and modify their behaviors to achieve goals or change organizational practices. It is the integration of acquired knowledge into the organization [16].

Knowledge storage is the preservation of knowledge within the school system and those activities that maintain that preservation. It involves the process of document codification for information retrieval and knowledge creation. Acquired and stored knowledge can spread to become common knowledge for school members. KM also solves this problem.

Knowledge generation is the discovery of new knowledge through lessons, creative thinking, research, experimentation, and innovative development. It means that school members organize their knowledge to generate new ideas to be applied specifically to schoolwork or problem-solving.

In schools, KM assists organizations in measuring, storing, and effectively using knowledge. KM increases problem-solving capabilities and the ability to make improvements [5]. The KM approach in schools enables teachers to develop practices to collect and share information to improve teaching and learning outcomes [16].

Through effective instructional supervision, principals can help teachers retrieve, share, utilize, store, and generate knowledge. KM not only provides a platform for teachers to discuss teaching ideas and share educational resources but also stores the expertise of experienced teachers. This increases teachers' effectiveness and professional development, supports the development of a knowledge community in schools, and fosters a culture of learning [5].

KM processes promote mutual understanding among teachers of school practices and the power and accountability hierarchies. Therefore, it creates human, internal, and external capital. In summary, KM processes empower teachers to act and communicate effectively by equipping them with required knowledge [17].

2.3. Professional development

Teacher knowledge contributes substantially to effective teaching and creates more accepting students [18, 19]. Research on teacher expertise underlines the importance of professional development for mastery of tasks typical of the profession [4]. A frequently cited heuristic to classify components of teachers' professional development was provided by Desimone [20]. The classification has greatly influenced the understanding of teachers' professional development.

Professional development is a key to reforms in teaching and learning. Recent research agrees that the following characteristics of professional development are critical to improving teacher effectiveness and increasing student achievement: (1) content focus, (2) active learning, (3) coherence, (4) duration, and (5) collective participation. Studies acknowledge these as critical components of effective professional development [4, 20].

The content focus of teacher development may be the most influential component. Evidence from the past 20 years links activities focused on content to student comprehension of that content. With increases in teacher knowledge and skills come improvements in practice and increases in student achievement. This evidence comes from case studies, national teacher questionnaire analyses, experiments, longitudinal studies of teachers, and experimental designs [4, 20].

Opportunities for teachers to engage in active learning also influence the effectiveness of professional development [4]. Active learning, as opposed to passive learning typically characterized by lectures, can take a number of forms, including teacher observation, followed by interactive feedback; reviewing relevant student work; and leading discussions [18].

Coherence is the extent to which teacher learning is consistent with teachers' knowledge and beliefs. The consistency of school, district, and state policies with what is taught in professional development defines coherence [20].

Research shows that intellectual change necessitates professional-development activities of sufficient duration, including both the time over which the activity is performed (e.g., 1 day or one semester) and the number of hours spent performing the activity each time. Research has not indicated ideal durations but has supported activities that spread over a semester [20].

Another component of development is collective participation. This can be accomplished through cooperation of teachers from the same school, grade, or department. Such arrangements promote interaction and discourse, which can be powerful forms of teacher learning [4].

Teachers' professional development and their teaching effectiveness can de predicted by teachers' KM behaviors [17, 21, 22]. The better teachers' KM is, the better their professional development and teaching effectiveness. Therefore, if teachers' KM behaviors improve, their professional development and effectiveness will also improve. If teachers can continually update their own knowledge through personal and school KM behaviors, they also improve professional quality and ability.

3. Summary

The data from the literature review and teaching experiences in recent years are collected. In summary, there are two central components to the conceptual framework for studying principals' instructional supervision, teachers' KM behaviors, and teachers' professional development [4, 6, 12, 16]. One recognizes a set of critical factors that defines effective instructional supervision, KM behaviors, and professional development. The second establishes an operational path for how principals' instructional supervision affects teachers' professional development and KM. It identifies the variables that mediate (explain) the effects of professional development. A basic model, shown in **Figure 1**, is proposed and its use in all empirical causal studies is recommended.

The model represents the relationships among principals' instructional supervision, teachers' KM behaviors, and teachers' professional development. As shown in **Figure 1**, a theory of action for principals' instructional supervision, teachers' KM behaviors, and teachers' professional development would acknowledge these relationships:

1. Principals' instructional supervision can affect teachers' KM behaviors.
2. Principals' instructional supervision can affect teachers' professional development.
3. Teachers' KM behaviors can affect their own professional development.
4. Teachers use their new knowledge, skills, attitudes, and beliefs to improve their effectiveness.

In **Figure 1**, principals can use direct assistance, group development, professional development, curriculum development, and action research to positively affect teachers' KM behaviors. For example, if teachers want to share their knowledge with their coworkers, principals can try to promote a positive attitude and develop a friendly atmosphere in teachers. Next, principals should create teaching groups, and let teachers learn together through the interactions. By doing so, teachers are tend to share their knowledge and believe that principals' instructional supervision can bring benefits to them.

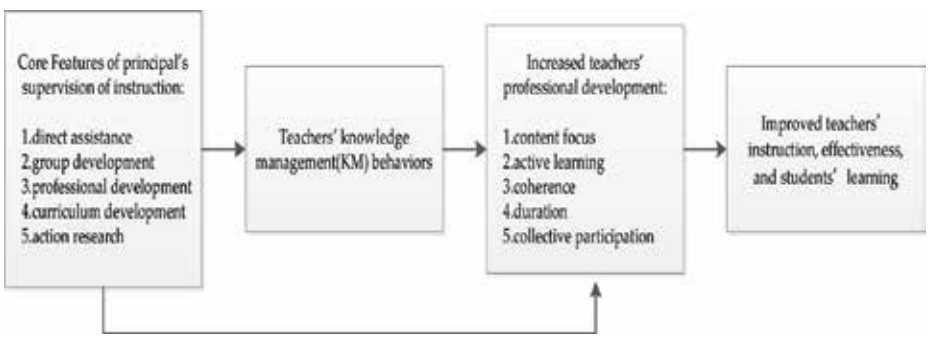

Figure 1. Proposed core conceptual framework for studying the effects among principals' instructional supervision, teachers' KM behaviors, and teachers' professional development.

After that, principals' instructional supervision can affect teachers' professional development. For example, if teachers lack the awareness of content focus, principals should use the direct assistance and curriculum development to make teachers understand the curriculum and strategies in teaching. Principals in Taiwan often assist teachers through workshops to develop instructional competence.

Next, teachers' KM behaviors can positively affect their content focus, active learning, coherence, duration, and collective participation. For example, if teachers have the habits in share their knowledge with each other. The flow in knowledge is frequent. Thus, teachers tend to acquire the knowledge and be an active learner. Teachers generate new knowledge through lessons, creative thinking, research, experimentation, and innovative development. Teachers have positive teacher efficacy and want to improve themselves. If teachers' professional development is increasing, students can get benefits from the process. If teachers' get professional development, their students' grades in examinations will be better than before [4, 23].

This model allows for testing how teachers' can change their own professional development. The model operates with context as a mediator. Each relationship in our path model is reflected in the literature: links among principals, teachers, and students; instruction and student achievement; professional development and teachers' practice; and professional development and student achievement. Although empirical studies including all these elements are rare, the basic components are nearly universal in the theoretical trajectories of teacher learning, but sometimes changing the order to reflect teacher belief changes as a function of improved students' learning [19].

4. Conclusion

Research step 1 proves that "Principals' instructional supervision can positively affect teachers' KM behaviors." Principals use direct assistance, group development, professional development, curriculum development, and action research to affect teachers' KM behavior [4, 5].

Data collection is the basis of instructional supervision. Principals should allow teachers to understand that the classroom observation data and collection of relevant information are crucial means of instructional supervision. These collections serve as a starting point for the teacher's teaching plans. These data can be considered as true, evident, and measurable observations and as a long-term assessment report. By doing so, the principal can offer more general judgments and collect relevant information for teachers' reference and discussion. The principal's sincere attitude and enthusiasm for participation are critical to improving instructional supervision.

This step suggests that the principal should encourage teachers to retrieve documents related to teaching information and knowledge they need by utilizing the school intranet, the Internet, and assistance from colleagues. They can also internalize and apply teaching knowledge to real teaching situations to solve problems and teaching-related issues and provide professional teaching knowledge to coworkers through experience sharing. Currently, teachers

preserve knowledge within the school for retrieval, which demonstrates that teachers do not believe they can create knowledge through sharing; they rather believe they can only retrieve knowledge for use, share it with colleagues upon request, and store it in a repository.

Research step 2 demonstrates that "principal's instructional supervision can affect teachers' professional development." As previously indicated, teachers want to be consulted before CWTs and classroom lesson observations are undertaken. Most principals maintain that instructional supervision is a professional activity that should be left to professional teachers. This argument disqualifies principals from direct classroom supervision because they are managers and not teachers [4, 6].

Contrary to this view, principals have an official role in overseeing the implementation of the broad curriculum in their schools. Some researchers define instructional supervision as an assessment to improve performance [11, 14]. If principals are curriculum overseers who ensure its proper implementation, then they advise teachers. This makes them instructional advisors or supervisors. According to this argument, little difference exists between the principal as a curriculum overseer or leader and as an instructional supervisor. In both roles, the principal can offer advice for improvement; however, in curriculum oversight or leadership, the purpose is less explicit than in instructional supervision.

Research step 3 shows that "teachers' KM behaviors can affect their professional development." Other researchers have found that "KM behaviors can positively affect teachers' professional development." For example, knowledge retrieval involves the process of capturing existing knowledge from the Internet, school intranet, seminars, and meetings through its formalized representation and acquiring the required knowledge and information. Knowledge sharing involves the knowledge flow from one community to another and the transmission of school knowledge to everyone who needs it.

Teachers often acquire knowledge through oral communication, community study, file archiving, the Internet, and collaborative teaching. Knowledge is extracted and disseminated, appropriately classified, coded, and stored. However, efficiently extracting various teaching methods and techniques and applying them to the teaching processes remains a challenge, which is related to knowledge storage. If the classification, compilation, coding, storage, and archiving of this knowledge are more thorough, teachers can apply the knowledge more effectively. By doing so, teachers implement KM behaviors to aid their professional development.

Both strategies empower teachers to act and communicate effectively by equipping them with the required knowledge. Therefore, these strategies facilitate teachers to work effectively, thus enhancing human capital. This promotes a mutual understanding among teachers of the school practices and power and accountability in hierarchies. Moreover, it creates structural capital and policy capital and enhances the communication among stakeholders, thus building external capital. This suggests that the crucial aspect of KM is to encourage people to share knowledge. Knowledge can be reconstructed through discussion and collaboration, which enhance teachers' professional knowledge and development. These KM theories confirm that value is created when various types of knowledge are combined to generate new applications [4, 5].

Research step 4 proves that "teachers use their new knowledge, skills, attitudes, and beliefs to improve the content of their instruction and students' learning." We know that principal's instructional supervision can positively affect teachers' KM behaviors and professional development. Mediated by teachers' KM behaviors, principal's instructional supervision can also positively affect teachers' professional development.

School instructional supervision refers to the interaction between the supervisor and supervisee, with each having a recognized input in the process but within a defined individual role. As such, teaching as a group effort toward a group goal should not be prescriptive for teachers. Goals should be set through discussion among members.

A research view that instructional supervision should be made an integral part of the curriculum to ensure continuous development supports teachers' demand for a collegial instructional-supervision system [24, 25]. Teachers' views on instructional supervision may be borne out of the fact that in Taiwan, instructional supervision is poorly structured, with no clear policy related to it. However, the K-12 Education Administration and the Ministry of Education in Taiwan issued guidelines for instructional supervision. First, these intended to strengthen the function of three objectives: (1) implementation of education policies and measures, (2) improvement of teaching quality, and (3) project visitation and assistance in handling major incidents. Second, the responsibilities of staff and the teaching supervisor were explained to help guide teaching, curriculum planning, and teacher counseling. Third, the guidelines intended to take account of the administrative and instructional supervision and assist schools in developing their own characteristics. These guidelines intend to help develop school-based curricula and teaching activities based on the characteristics of schools and adopt appropriate teaching and learning methods to enhance school performance [26].

Principals have been designated as curriculum overseers, and they should undertake instructional supervision. Considering curriculum leadership or oversight to be intricately linked to instructional supervision suggests that principals must also play a role in instructional supervision. This role should be defined and restricted to controlling (because they are accountable for the curriculum), supporting, and facilitating supervisory activities.

Knowledge retrieval, sharing, utilization, storage, and generation are identified in this study to be the KM processes that enhance teachers' professional development and their teaching effectiveness. A model articulating the predictive relationship among instructional supervision, KM behaviors, and teachers' professional development was constructed in this study. This chapter contributes to the existing literature by providing an empirical model for the implementation of instructional supervision to enhance KM and teachers' professional development. These improvements can sustain school development in the wave of quality-assurance policies and marketization in education.

School principals may consider implementing instructional supervision in the school to strengthen teachers' professional competency, formulate effective policies, and seek external resources for sustainable development. If principals only enact instructional supervision, disregard the importance of KM within the organization, and neglect to allow teachers to use formal and informal channels to circulate ideas among themselves, the effectiveness of instructional supervision will be limited.

Therefore, principals should encourage the retrieval, sharing, utilization, storage, and generation of knowledge in the school through school magazines, class newspapers, and teacher-management concepts. Principals should also encourage a learning community and professional dialog among teachers to activate KM in the organization. They should enable teachers to be more skillful in teaching and implementing their tasks concurrently. In the field of action research, there is a steady stream of innovative ideas. The effectiveness of teacher professional development is effectively enhanced when the team of teachers has been encouraged to be a learning community.

Principals should also foster teachers' concept of KM and the willingness to share knowledge. They should encourage teachers to apply knowledge and innovate knowledge together. These behaviors will help teachers to improve their planning and preparation, teaching skills (techniques and strategies), teaching materials, learning-atmosphere management, teaching achievements, and evaluation. With good KM, appropriate changes and innovations can be implemented in teaching to improve teachers' effectiveness and development in the e-generation learning era.

Besides the abovementioned opinions, due to the research of principal's instructional supervision, teachers' KM, and teachers' professional development is just on the beginning. In the future, the author believes that more relevant mediated variables between principal's instructional supervision and teachers' professional development can be explored. These mediated variables are including organizational structure, organizational culture, organizational citizenship behavior, teachers' flow experience, and so on.

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Section 2

Innovative Practices for Teacher Education

Chapter 5

Knowing Pedagogical Dialogues for Learning: Establishing a Repertoire of Classroom Interaction Practices as Core Teaching Practice

Christine Edwards-Groves

Additional information is available at the end of the chapter

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Abstract

Pedagogical talk in classroom lessons forms the dynamism of teaching and learning. Understanding how talk functions and influences learning in highly nuanced ways is a fundamental matter for understanding professional practice, and indeed teacher efficacy. However, it is often the case that preservice teacher's (PSTs) explicit knowledge about the role of dialogue for accomplishing lessons hovers above understanding and enacting a repertoire of talk moves that 'actively' promotes student learning and agency. Indeed, both a meta-awareness of dialogic approaches to teaching, and a metalanguage language for talking about talk in lessons, is generally limited to cursory knowings focused on questioning. Arguably, this limitation has the potential to restrict student learning when PSTs begin their teaching careers. The chapter draws on a three-year empirical study conducted in a teacher education faculty in rural Australia. The study centred on supporting PSTs understand dialogicality as core to teaching and to practise enacting quality pedagogical dialogues in classrooms with students. Specifically, this chapter argues that to be productive it is necessary for PSTs to understand, develop and practise a repertoire of interactive talk moves that treat student contributions in discussions as critical for the accomplishment of productive learning experiences.

Keywords: action research, classroom talk, interaction, mentoring conversations, pedagogical dialogues, practice architectures, talk moves

1. Introduction

Interacting with people is a taken-for-granted and assumptive facet of humanity. In everyday life, communicating (and the language that shapes it) forms a fundamental and familiar

social and societal activity. As Johnston ([1], p. 9) explains, language "is not merely *representational* (though it is that), it is also *constitutive*. It actually creates realities and invites identities". Thus, for teachers in educational settings, language and its use is critical for shaping the realities and identities of the students in their classrooms. And indeed, as Johnston ([1], p. 4) suggests, quality "talk is the central tool of a teacher's trade. With it they mediate children's activity and experience, and help them make sense of learning, literacy, life and themselves". In classrooms interacting and communicating with students emerges as especially complex since the kinds of interactions that occur in classroom lessons differs from those encountered in everyday life. Classroom interactions, in the main, are not like dinner table conversations, nor are they like a chat with a group of friends, they are different simply because of the number of parties (a cohort of many students and their teacher) involved in the interactions. In schools, as well as a socialising function, the power of language encountered in day-to-day lesson activity extends to having a pedagogical function and a managerial function. Through it, a

> *[t]eacher's language can position children as competitors or collaborators, and themselves as referees, resources, or judges, or in many other arrangements. A teacher's choice of words, phases, metaphors and interaction sequences invokes and assumes these and other ways of being a self and of being together in the classroom (*[1], *p. 9)*

Classroom talk, and the dialogues that shape it, thus is a powerful and influential practice architecture for shaping teaching and learning, a critical aspect of everyday pedagogical practice. Further to this, its efficacy in lessons is a fundamental matter for understanding professional practice, the dynamism of teaching and student learning. The question is to what extent teachers have an explicit working and workable knowledge of its role and influence on student learning, participation and engagement, and the flexibility to adjust the discursive flow of lesson interaction sequences (for different pedagogical, social and managerial purposes) through strategically enacted talk moves. This chapter examines the flexible enactment of classroom talk and the pedagogical dialogues it enables and constrains as a matter of urgency for teacher knowledge professional knowledge and in particular for teacher education.

2. Understanding the problem of pedagogical talk and classroom interaction

Teaching is an interactive, observable activity and is patterned in the sense that what teachers and students do and say does not occur randomly; but has recurring and characteristic patterns which have been found to exist in the analysis of classroom literacy lessons [2, 3]. However surprisingly, that in classrooms where students are expected to develop and use oral language and to learn to interact and to learn content through interacting with others, the extensive body of research in this field shows that it is still the teacher who does most of the talking ([4], p. 4). Although much research on how talk functions as a pedagogical tool and influential for student learning in highly nuanced ways, it is an aspect of practice that remains entrenched in predictable teacher-student exchange patterns and interactive routines. Foremost is the tri-part question-answer teacher-dominated turn-taking sequence known as

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the recitation script [5]; this typically involves a teacher **I**nitiation (generally a question) move, then student/s **R**esponse/s move, followed by a teacher **E**valuation or **F**eedback move. This exchange system is commonly referred to as the IRE/IRF [4, 6]. It has been shown to be an asymmetrical teacher-controlled interactive structure that, and as Cazden [5] identified, provides two turns for the teacher and one for one student from the cohort in every exchange sequence. Further, it has been suggested that this talk structure governing the conduct of many lessons also limits dialogic talk in lessons since students' turns are often restricted to the response slot in the three-part structure [4, 5].

In 2006, Nystrand ([7], p. 394) recognised that classroom interaction practices have "have remained remarkably unchanged over the last century and a half". Skidmore ([8], p. 511) even suggested it is "the groove into which classroom pedagogy so easily settles by default". Indeed, "even experienced teachers themselves have limited knowledge about this dimension of their pedagogical and curriculum work" ([4], p. 4). Yet, shifting away from the recitation script or varying teacher talk moves to become more dialogic appears to be difficult [9], or at best marginally accomplished unless deliberate moves are made by teachers to achieve more dialogic talk practices [9, 10]. Although over many decades longer term spaced teacher professional development, including action research studies conducted with teachers, have made attempts to support teachers disrupt the resistant hold of the IRE/F on their classroom talk and interaction practices [11, 12–14], monologic talk remains intractable.

Conceivably, part of the perpetuation of the issue is that in preservice teaching courses in many institutions, learning teaching practice has had a limited explicit focus on classroom talk [15]. It is often the case that preservice teacher's (PSTs) explicit knowledge about the role of dialogue for accomplishing lessons hovers above understanding and enacting a repertoire of talk moves that 'actively' promotes student learning, participation and engagement and agency. Indeed, both a meta-awareness of dialogic approaches to teaching, and a metalanguage or a more precise technical language for talking about talk in lessons, is generally limited to cursory knowings about questioning. Developing a metalanguage about talk and interaction is necessary for PSTs to be able to speak coherently (to each other and to other education professionals) about how dialogue works as a pedagogical practice; developing a meta-awareness is an overt consciousness, knowledge and understanding of one's own dialogic practices as enacted in practices. These are considered central for practice development [15]. Arguably, this limitation has the potential to restrict student learning when PSTs begin their teaching careers.

A focus on the talk and interaction makes visible the systematic ways in which teachers and students create their relationships and their classroom culture, the power and precision of verbal and non-verbal interaction in the production of classroom knowledge, and the ways in which what *counts* as learning is established [16]. Therefore, against this historical background of the study of classroom talk and interaction and understanding of its function as a core teaching practice, implications for PSTs are underscored. The unyielding taken-for-grantedness of classroom talk and its resistance to development and change in professional practice leaves open the question about whether an explicit focus on talk and interaction in teacher education courses is necessary if future teachers are to understand and enact a flexible repertoire of classroom talk and interaction moves. Faced with a career that inherently rests

on their capacity for talking and interacting with their students (as a core pedagogical tool) [17, 18], it stands to reason therefore that such a focus is not only warranted, but essential if indeed the promises of education are to be realised. The central argument in this chapter therefore asserts that an explicit knowledge of the role of classroom talk and the development of a repertoire of dialogic talk moves cannot be taken too lightly in preservice teacher education. Further, that to change current practices in teacher education requires changing the practice architectures that enable and constrain learning dialogicality as a critical dimension of teaching practice.

3. Theoretical framework

In recent years, a new line of enquiry in practice theory offers a new way of conceptualising practice and practice development. Among others, Green [19], Kemmis and Grootenboer [20] and Schatzki [21] have sought to show how practices–like practices of teaching and learning – are held in place by distinctive preconditions which enable and constrain particular kinds of interconnected activities, language and relationships which together constitute a practice of one kind or another. Theoretically, the chapter draws on the theory of practice architectures [20, 22] which proposes that practices – like teacher education, teacher learning and teaching – are informed and shaped by particular *cultural-discursive* arrangements (the sayings of a practice), *material-economic* arrangements (the doings of a practice) and *social-political* arrangements (the relatings encountered in practice) which prefigure, but not determine, the practice.

In this vein, the multidimensionality of the practice arrangements of learning to teach during school-based professional experiences is explored. This theory seeks to understand teaching and learning practices in the sites within which they happen *as* they happen; that is, it seeks to make meaning of the existential and site ontological dimensions of practice in school classrooms [23]. After Schatzki [21] and Kemmis et al. [22], considering the existential (that which actually exists in time and space) and site ontological (where practices actually happen) dimensions of practice means grappling with the robustness and complexities of lived realities and site-based conditions that influence the social orders that exist in actual sites or places where social practices like teaching and learning are enacted. Through empirical material, the chapter seeks to provide dynamic descriptions of the particular conditions that stimulate and support the practice development of PSTs through their interactions with students in classroom sites.

Specifically, participant accounts and how the particular practice arrangements of interacting with students in classrooms form the intersubjective mechanisms for understanding how learning about teaching dialogically take place will be presented. This view of practices aims to provide the means to analyse practices like teacher education and to discover the conditions (the practice architectures) which make them possible. Practically, the nature of the interactions PSTs have with students in classrooms as a platform for learning about teaching, learning about learning and connecting this to theory will be examined. What PSTs learn about dialogic

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teaching from listening to and interacting with students in classrooms and the value they place on this as formational for understanding teaching from their first session of study will be highlighted.

4. Reconceptualising teacher education courses: supporting PSTs understand teaching as an interactive activity

This chapter draws on a three-year empirical study conducted at a rural Australian university which investigated how learning teaching practice is not only informed but formed through interrogating the theory-practice nexus *in enactment*. It was notable that in this particular university site, classroom talk and interacting with students in classrooms was not the focus of explicit instruction in coursework or practicum placements for PSTs; it was taken-for-granted that PSTs could interact with students in classrooms. As a response to this enduring issue, the project presented in this chapter formed part of a broader study investigating teacher education practices aiming to support PSTs move towards pedagogical efficacy. Pedagogical efficacy, according to [24], depends not only on what one does, but also on the depth and quality of the understandings by which it is guided. Therefore, establishing what knowledge and theory actually guides and determines a PST's actions in the context of their interacting with students in classroom lessons in order to develop their practices from the onset of their careers, is a fundamental platform from which professional practice is improved.

The specific project, *Talking to Learn*, called for teacher educators to reconceptualise their courses and approaches for supporting PSTs develop core skills and teaching practices [17, 18, 25, 26]. Central to the project was making explicit the theory-practice nexus. The importance of the interconnection between theory and practice is also expressed strongly by Hughes [27] who suggested that without theory, practice consists of a set of unrelated actions with little or no basis for improvement.

4.1. The talking to learn project rationale

The project was developed based on the fundamental premise that it is through quality interactions with students in classrooms that teaching efficacy is constituted [28]. It centred on the development of quality classroom interactions and dialogic pedagogies of PSTs–issues of practical concern for education globally [29–32]. In fact, it aimed to redress the fact that classroom talk and developing dialogic teaching practices in classrooms remains implicit, taken-for-granted and under-examined in preservice teacher education courses [33]. Furthermore, explicit instruction along focused opportunities for 'practising' engaging in dialogic pedagogies with students in classrooms, currently receives little dedicated space in many preservice education courses [28]. This neglect leads to a tendency for PSTs to enact a default practice in placement classrooms based on replicating known patterns of interaction of those observed and those experienced in their own education [33].

Therefore, the *Talking to Learn* project aimed to support PSTs understand how classrooms work interactively and, in particular, draw their attention to the organisation of classroom discourse as a powerful way of showing them the situated construction of classroom life, learning and culture. Further, supporting PSTs to critically examine the nature and extent of their learning about and enacting pedagogical dialogues was considered critical for their development as a teacher. Explicating the role of particular teacher talk moves, as core for generating teaching practices necessary for generating learning and thinking, formed an explicit focus for post-session learning conversations between teacher mentors and PSTs [28]. These conversations took place in classrooms after PSTs practiced interacting with small groups of students. This feature of the project provided an authentic context for 'informed participation' in critique about teaching practice [34].

4.2. The project design

The project design was premised on the need for PSTs to overtly focus on developing quality interactions and pedagogical dialogues with students in classrooms. In this project, volunteer PSTs were guided to pay close attention to the details of the discursive details of the language, discourse patterns and routines actually spoken by teachers and their students in classroom exchanges. Preservice teachers, in mentoring pairs, then 'practised' interacting with small groups of four to five students in their classrooms. The focus for the PSTs was on listening and interacting rather than on teaching or being assessed as typical in practicum placements. Primarily, the project was designed as an action research project designed to provide first year PSTs with weekly opportunities to:

- participate in overt instruction about classroom interaction and pedagogical dialogues focused on enacting particular talk moves that support students to:

  1. sustain the point
  2. extend and deepen their thinking to build participation and engagement
  3. challenge and question the thinking of others
  4. demonstrate listening actively

- focus observations of teaching in classrooms on the dimensions of interaction and dialogic talk, which included 'learning to listen' to what students said, the language used, how they interacted with each other;
- practice

  1. allowing wait time for thinking and formulating
  2. asking open guiding questions
  3. vacating the floor

4. giving learning focused responses
5. reflecting on and reviewing learning

- develop quality dialogic practices through authentic learning experiences with small groups of students in classrooms by practising a repertoire of talk moves; and
- talk with peers and classroom teacher mentors through mentoring conversations (critical reflection and mentoring feedback).

These weekly in-class observations, practice sessions and mentoring conversations (after [35]) were conducted over 12 weeks in the first semester of their Bachelor of Education degree.

4.3. Learning through authentic experiences in classrooms: observing, listening to and interacting with students

Research on what PSTs learn through authentic experiences in classrooms is overwhelmingly dominated by reports on what they learn from listening to and interacting with supervising teachers. However, there is a dearth of research specifically describing what they learn through their interactions with students in the classrooms.

The idea of learning to observe and listen to students in classrooms is not new. 'Kidwatching' (coined by Yetta Goodman [36]) emerged and evolved over time as a concept which encompasses listening to and observing students in classrooms with the aim of assisting teachers learn to develop responsive practices and enhance their professional work. However, 'kidwatching' has remained a province of teachers rather than as a focused approach for strengthening the learning of PSTs. Moreover, although quality interactions are recognised as a feature of effective teaching, it typically receives little dedicated space for development across many teacher education programs. Research has shown that a limited focus on developing effective classroom interaction leads to a tendency for PSTs to enact, predominantly by default, more traditional communication practices in placement classrooms (such as didactic teacher dominated talk). Their interactive practices are often based on replicating known patterns of interaction experienced in their own school education [33].

Interestingly, research reporting on PSTs observing and listening to students in classrooms appears to be mainly locating in analysing videoed lessons [37], or in lessons focused on the subject of Mathematics [38, 39] or music [40]. This chapter is an attempt to re-theorise the development of quality teaching practices in teacher education [41] and to illustrate how a focus on *practising* interacting with students in classrooms influences what PSTs learn about dialogic teaching from listening to and interacting with their students in their school placements. Furthermore, I aim to show how learning to listen and learning to interact in contextually relevant sites is critical for bridging and extending the theory-practice nexus. It will be argued that to know about the role of classroom interaction for learning is simply not enough, what is required for PSTs to develop a repertoire of dialogic talk moves is overt *designed-in* opportunities to focus on learning to listen, observe and interact with students in classrooms.

5. The action research approach

The study was a three-year qualitative research and drew on a range of qualitative research methods, including participatory action research [42]. Over the period of the study, participants included 346 PSTs (all of whom participated in the compulsory in-class program, the instruction and the final evaluation survey) and 24 PSTs (from the larger group) who volunteered to audio-record their small group interactions with students in classrooms and to participate in recorded follow-up de-brief mentoring sessions and interviews. Participation in the recording of in-class interactions and the interviews was optional since it was the first session of study for the degree for these first year PSTs. Volunteer students (arranged in pairs) were purposively placed in the one school so that teacher lessons and follow-up de-brief sessions were more easily recorded. Along with the group of 346 PSTs, other participants included 16 classroom teachers and six academics, who also participated in instructional sessions at the university and the final evaluation survey conducted after the in-class experiences at the end of the semester.

Data collection periods were mainly in the first semester in each year of the study. In particular, recorded interviews, observations of volunteer first year PSTs interacting with small groups of students in classrooms and observations of these PSTs participating in de-brief mentoring conversations with their supervising teacher were conducted (see Edwards-Groves [15]). Data from the audio-recorded small group interactions between PSTs and their small group of students (24 recordings in total) were transcribed as a record of the actual discursive production of the talk-in-interaction [2, 43]. Further, each classroom teacher and pairs of volunteer PSTs were issued with a small video/audio recorder (Flip Cameras) for the duration of the study to record the classroom lessons, mentoring conversations and small-group interactions. Additionally, post-observation discussions and focus group interviews with PSTs were conducted after the in-classroom sessions were completed at the end of the university semester. These data were audio recorded and transcribed. The research was approved by the University's Human Ethics in Research Committee and according, informed consent was provided by PSTs, academics, teachers, principals, students and care-givers. Participants were sent transcripts of interviews for the purposes of validation; noting this provided them with an opportunity to verify, confirm and clarify their comments and make adjustments and additions to their recorded words if necessary.

Thematic analysis, as described by Braun and Clarke [44], was employed in this study since it is a useful and flexible method appropriate for a range of theoretical and epistemological approaches. Used to identify, organise, analyse, and report patterns (themes) within and across a corpus of data [44], it offers scope to develop rich and detailed, yet complex accounts of data. Specifically, in this study Braun and Clarke's six-phase coding process was used to delineate clearly established, meaningful patterns. These phases are: familiarisation with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes, and producing the final report ([44]; p. 16). Following this process through several iterations provides the analyst with the analytic mechanism for pinning down the

particular themes considered critical for answering the particular inquiry. This chapter specifically draws on selected excerpts of recorded lesson interactions between volunteer pairs of PSTs and their follow-up semi-structured focus group interviews [45]. These interviews were conducted to build participant accounts and associated attributions of participant experiences and explanations of the teaching practices in focus [46].

6. Findings and discussion

Thematic analysis of the recorded debrief interview, post-observation discussion and small-group in-class data elicited three broad themes. Specifically, it revealed the learnings occasioned by first year PSTs about the value they placed on: first, kidwatching and critically observing talk moves in classroom lessons; second, 'actually' practising interacting with students in classrooms; and third, how they attributed much of what they had learnt about dialogic teaching to the focus on learning to listen and interact with students. These themes will be discussed in turn.

6.1. Kidwatching and critically observing talk moves in classroom lessons

Observing the interactive dimensions of teaching provided PSTs with an opportunity to focus on how talk and interaction in classroooms works to support student learning and participation. In Excerpt 1, from a transcript of a post-observation discussion PSTs Ryan, Lily and Ben discuss the Grade 3 lesson on space they had just observed.

Excerpt 1: The Greek chorus: PSTs discussing a lesson observation

1. Ryan: … I noticed though it's not really a discussion if the teacher controls it all the time, it seemed to be a management structure which features the initiation so a teacher asks the questions, and what she's saying's usually ambiguous, quick fire questions and invites this back and forth with the students, that's less engagement in learning content, that it is actual pseudo participation, so it's kind of like a Greek chorus if you like, where there's that toing and froing but there's not actual engagement in learning=
2. Ben: =or even a dialogue, it's more ((Lily interrupts))=
3. Lily: =So, it's not a learning conversation then, is that what you mean?
4. Ryan: Yeah and it's so fast paced it's like really clicking through and then it's usually met with feedback along the lines of, well done, thanks for that, like it's not taking it to that next level of feeding it back to the class, what do we think about that or taking it to another step by extending learning so it's like a=
5. Lily: =so yeah that to and fro she's doing closes down opportunities for extending deeper thinking, learning, or you know extending student growth, rather than opens them up and it shuts down the possibility of reflective answers from the students

6. Ryan: one thing I was thinking about was vacating the floor, and how part of a dialogue was silence, being comfortable with the silence in wait time and owning it to give the kids enough to think about what to say first and talk among themselves=
7. Lily: =so the kids have enough time to really get a good response happening, like its handing the control a bit back to the students
8. Ben: arh:ha, and watching the kids talking with each other in their groups was so interesting, you know their body language too and how they were so used to the school thing of putting up your hand and stuff, one thing I saw some kids looked bored, that they did not know, but I knew they were clever because of what they were saying to me in the group
9. Ryan: =so makes you wonder what they really know about the universe and space actually, because most of them do not get to talk at all
10. Ben: and so I was wondering about that, I was wondering about just, as an aside, where all that sits with learning. So, if we've got this system that's based on control of dialogue it's the same as being the gate keeper of knowledge or the truth, it's the same as classroom control and power. If you've got all that going on with using dialogue for opening it all up, then you're going to have fantastic problem solvers and you're going to be building genuine knowledge
11. Lily: but good point, I did not think about that, um so when you actually have children being encouraged to have multiple perspectives and they have different meanings and multiple meanings from the same text, how challenging would that be, be to manage?
12. Ryan: exactly and so what I was talking about before with everyone being funnelled towards one understanding, you know with the IRF, to get to this sort of dialogic talk is having multiple perspectives and all the different things can be true about the same thing at the same time; but how is that reflected in standardised testing where you have got to have that one answer correct?…

In this segment these three PSTs raise several interesting themes related to dialogue in classroom lessons and how it relates to learning. In turn 1, for example, Ryan recognised the ways the IRF relates to an awareness of power and management in classroom interactions. In fact, he described the IRF interaction exchange structure he was observing as "pseudo participation". Lily developed Ryan's point further (in turn's 3 and 5) by clarifying that it actually is a move that is counter to a "learning conversation". She then extended the idea by suggesting that the "toing and froing closes down opportunities for extending deeper thinking, learning". Her comments that the IRF is a structure that shuts down participation orients to the notion that she recognised that it might, in fact, restrict student growth.

Ryan and Ben develop the point about the IRF question-answer structure further by raising the matter of strategic silence and owning the silence. Their comments suggest that having the teacher vacate the floor to let students have more control of the conversation makes it more dialogic. As Ryan (turn 6) stated, "being comfortable with the silence and owning it, to give

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the kids enough to think and talk among themselves" is a critical talk move that enables, as Lily (turn 7) adds, "kids to have enough time to really get a good response happening". She went further to suggest that it shifts power by "handing the control a bit back to the students", rather than as Ben (turn 10) recognises, the teacher being "the gate keeper of knowledge and truth". Ben's example (in turn 8), highlighting the ways that interactive routines like raising your hand to indicate knowing or preparedness to offer a response to a teacher question, can in reality function to limit student's capacities to demonstrate what they actually or genuinely know about a topic like the universe or space; thus as Ryan suggested (in turn 1) means "less engagement in learning content".

Through their conversation it was evident that they were explicitly noticing and critiquing talk moves and using a metalanguage for describing it; for instance, they made connections to dialogue, problem solving, vacating the floor, extending learning, knowledge development, providing learning focused feedback, open questioning, having multiple perspectives, reflective responses, and wait time. These aspects of pedagogical dialogues, for them, became explicit knowings and the focus on observing classroom interactions was a practice architecture that enabled this to emerge. It was evident that as Ryan, Lily and Ben were orienting to the talk and interaction that they had observed they were at the same time building their understandings of it. Specifically, this was notable in turn 8 where Ben's response "arh:ha" indicates coming to a new understanding and Lily's acknowledgment (turn 12) that Ben's comment was a "good point" and one that she "did not think" about previously. Their exchanges showing how they were orienting to each other's thinking, demonstrates the ways they made critical connections between the practices they were observing, the theory they were learning about and the role of dialogues for student learning and engagement. And in fact, as Ben explained (in turn 8), kid watching was pivotal in this process. What is evident here is the theory-practice nexus *in enactment*. Their comments are particularly striking since these PSTs were only in their first session of their degree program.

6.2. Practising interacting with students in classrooms

One aspect of the *Talking to Learn* project was providing PSTs with weekly opportunities to practise interacting with small groups of students. After a few sessions, sessions PSTs tried out different talk moves. In this next segment (recorded on a Flip Camera issued prior to the project), PSTs Lily and Ben are working with a small group of five Grade 3 students; their focus is following up on the science lesson on space.

Excerpt 2: "Wow, you know more than me": PSTs interacting with a small group of students.

1. Ben: So, what did you do yesterday?
2. S1: We drew how big the sun, moon and earth was
3. S2: The size of the sun and the earth
4. S1: Because before we experimenting with the different balls-

5. Lily: oh, what about the balls?
6. S1: with the different sizes of the balls, like tennis balls and footballs
7. S4: like putting them in order
8. S1: approximately
9. Lily: So, what they actually were, as opposed to last week, you just drew what you thought the sizes were, did not you?
10. S3: Yeah.
11. Ben: Fantastic. And today, what did you get to do?
12. S5: Asked to, now that explain, explain the sizes, why the=
13. S: =Moon and the sun.
14. S5: Moon and the sun. How did we do that thing? How do we do it again? ((makes hand gestures representing making different sized circles))
15. S2: What?
16. S: No it's not like that ….
17. S: Like that?
18. S5: And the moon and the sun, explain why the moon and the, the moon and the=
19. Lily: =you forgot the word, it's sun.
20. S5: I said that, the moon and the sun.
21. S4: The sun's in the middle but … ((talk overlapping)).
22. S3: Is not it earth, moon and sun?
23. Lily: Well the earth, I guess she's thinking that the earth will be in the middle, and like, where we are, how come when you are in the sky we look at it and they look the same size.
24. S1: But we cannot see earth, can we?
25. S3: No you need a [big radio telescope, that's a big ….
26. S5: [You know, because we are in it.
27. S2: Oh, no even if you had a telescope you could not-
28. S1: But we **can** see it because we are in it-
29. S3: because telescopes look from where you are and not down at the Earth, you are not in a rocket
30. S2: yeah like you have to be in the sky=

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31. S4: =in space actually

32. S1: depending, though sometimes the moon is closer to the sun

33. S5: yeah like when it goes 'round the other side

34. Ben: wow, you know a lot, I better do some study, you know more than me

35. S2: I need a rubber. Where's a rubber?

This segment of talk between five students and two PSTs draws attention to the everyday sociality of lessons; it shows the discursive nature of how sequences of exchanges hold together to form a recount of a prior learning experience. Here participating meant listening to the students as they build their recounts to the initial question posed by Ben, "what did you do yesterday?" What unfolded was a sequence of turns whereby the students developed a collective response adding onto the turns of others (turns 2–8), asking for clarification from others (turn 22; 27–32), questioning (turns 24) and challenging another student's point (turns 24, 25–33). Practising interacting with these students involved talking with *and* listening to their responses. What is interesting is that in the post-session discussion with other PSTs, Ben admitted, "I didn't realise they knew so much". In this discussion Ben went further to explain:

> *I did not realise that listening, really listening to the children, was so hard. I really had to focus and practice.*

Lily agreed. She took up this point further in her comment:

> *For me active listening was a key to how much I learnt. I actually had to learn to listen to them with more care and precision. I did not sort of get they knew a lot already. I completely underestimated how much they already knew and could do with things like web searching… so if in the end I did not listen with intent then my teaching would lack responsivity and then in the end be completely ineffectual.*

Ben and Lily's comments highlighted a key finding; that focusing critically on listening to and interacting with students was critical for developing dialogic practices within the intersubjective spaces of classrooms. This approach highlighted, for the PSTs, the particular interactive orders and arrangements that shape a dialogic approach to teaching and learning practices (or not). It enabled them to recognise, experience and articulate how their interaction experiences provided a necessary condition for student learning and engagement. For them to be effective, they both sensed and experienced that pedagogical dialogues required an overt knowledge of talk and interaction and a distinctive shift of power towards enacting talk moves that reflected that pedagogy is a shared endeavour. As their peer Bridie agreed,

> *Through listening to another's point of view or opinion – including the children - I myself can learn more about various things and broaden my knowledge, and also can relate to what others may be feeling or thinking on a certain topic. This highlights what we need to explicitly know, the idea that classroom discussion between children can be a vital help to a child's learning through talking and listening and can have the same effect on them as it did on myself. Different talk moves can certainly help them go further, get involved more.*

Bridie's realisation that talking to learn should be the province of both the teacher and the learner is important for understanding the power and influence of talk and interaction (especially listening) on learning. Her comments show that rather than always having a focus on the act of teaching a lesson in their practicum placements, PSTs shifted their perspectives on what teaching practice entails by becoming attuned to dialogic pedagogies and the need to build a repertoire of talk moves as critical for interacting with students in lessons.

Through their engagement with learning to talk and interact with students in a focused way, PSTs began to orient to and critically reflect on their own interactions with their group of students. In post-session de-brief interviews, they raised a number of key points about developing and enacting a repertoire of talk moves. For instance, Bella conceded, that "wait time is hard"; she went on to acknowledge:

> *I learnt that I need to ask more open questions allowing the students to take the floor and also to get them to talk amongst themselves; that way, they learn, and grow in knowledge with each other, as the student who understands can solidify their own knowledge and for the student who does not, may learn from their friend or peer.*

An overt focus on learning about and practising talk and interaction seemed to be perceived as essential for develop metacognitive awareness of its power and influence on students learning and participating in lessons. Jeb's comments below were typical of the viewpoints of many of the PSTs:

> *I didn't realise I had to be more conscious about what I was going to say next, what talk move to use actually – that depends on what we were doing of course, but it takes a lot more thought to be effective I think. But the key for me really was having the chance to try out different talk moves.*

Without exception all PSTs recognised that, like Jeb, having the time background to after the second section as an essential condition for their own learning about classroom dialogue. This practice architecture, "the chance try out different talk moves", appeared to be a fundamental condition for understanding dialogicality, knowing about pedagogical dialogues and developing i) teaching practices, ii) dialogic teaching practices, and iii) a flexible repertoire of interaction moves. As Jeb said, it required an overt consciousness or meta-awareness of its impact on teaching for student learning; and that according to him, "it takes a lot of thought to be effective".

> *Learning about dialogic teaching through "talking to learn"*

In general, it was found that the many underlying beliefs held by PSTs about what teaching actually entailed were re-conceptualised as a result of the in-class focus on listening and interacting. This reflection by Ben was typical of the comments made by PSTs about the process:

> *So, having the chance to interact with the children in small groups gave me the opportunity to interact with a focus and apply and even understand the theory we have learnt in lectures and workshops without the distraction of the whole class around them.*

Collectively, the following themes from a thematic analysis of interview and survey data emerged; overall preservice teachers:

1. acknowledged that they had to learn to listen, it did not come naturally.
2. acknowledged that they had to learn to interact with children, for many it was taken to granted and so had to learn to talk with students and practise 'trying out' different talk moves.
3. highlighted that listening was a foundation for understanding student knowledge; many did not realise (and were surprised by) what students actually knew about the range of topics. They were of the belief that the role of the teacher was to deliver curriculum rather that the 'find out about the learner and what they knew prior to teaching'.
4. highlighted they had learned about the importance of responsivity in teaching; that is, by listening closely to what students said in interactions provides value information to which teachers should respond.
5. articulated an deepening understanding that classroom interactions form an intersubjective mechanism for teaching and learning, and they needed time to explicitly practise different talk moves.
6. recognised that different talk moves shifted the power and control of learning towards students.
7. reconceptualised classroom interaction as a pedagogical tool, rather than a taken-for-granted dimension of being a teacher.
8. articulated an understanding of the duality of their roles as a both a teacher and as a learner.

For the PSTs in this project, to conceptualise their understandings of the interactivity and sociality of pedagogy, they needed to engage in, practise, reflect on and analyse classroom practice at the primordial level of classroom interaction [2].

7. Conclusion

The challenge for teacher educators is always ensuring the role of quality teaching is developed across courses. This work needs to be both a theoretical proposition which guides teacher educators and preservice teacher's understandings and a practical proposition which supports efficacy in enactment. This study informs the field of teacher education about how and what PSTs learning about pedagogical dialogues through learning to listen and interact with students in the moment-by-moment interactions they encounter in classrooms. It was found that framing the in-class experience around learning about and enacting dialogic practices, and situating these experiences in classrooms as a site for learning teaching practice, made the focus authentic and timely for first year PSTs. It provided a fundamental, yet critical foundation for understanding and enacting a flexible repertoire of pedagogical dialogues. For PSTs the importance of connecting theoretical propositions made within teacher education course with the authentic interactions with students in classrooms from the beginning of their degree program generated a significant meta-awareness of the nexus between theory and practice.

This study provides timely outcomes in that it specifically documents the conditions, or changed practice architectures [22], required for PSTs to reconceptualise teaching and learning *as* interactive practice. The research also has important implications for ways in which PSTs reflect on [47] and theorise 'practices of learning' and 'practices of teaching' from the early stages in their formation as teachers. In this vein, to undercut ongoing issues of teacher efficacy by explicitly knowing about and enacting pedagogical dialogues in the future, classroom interaction and learning to listen to students needs to move more directly into focus in teacher education. To do this teacher education policy needs to ensure courses lead PSTs to construct and develop educational encounters which demonstrate a metacognitive awareness of the role of listening and interacting, and moreover provide overt ways for PSTs to practise different talk moves in authentic classroom contexts.

The results directly inform the global debate which focuses on the efficacy of preservice teacher education. In particular, this chapter challenges teacher education in its propensity for taking for granted the importance of creating focused opportunities for PSTs to learn to listen and interact with students in classrooms as an *existential and ontological* foundation for learning to teach. Broadening teacher education practices to more explicitly account for listening to and interacting with student in classrooms - without the constraints of assessment–must be addressed to advance educational development globally. In making these claims the chapter invites further exploration of practice development and in particular the development and enactment of core dialogic practices such as communicating, listening and interacting with students in classrooms.

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Chapter 6

Challenges in Addressing Metacognition in Professional Development Programs in the Context of Instruction of Higher-Order Thinking

Anat Zohar and Elina Lustov

Additional information is available at the end of the chapter

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Abstract

This study investigates challenges in addressing metacognition in professional development (PD) programs addressing instruction of higher-order thinking (HOT). A set of semi-structured interviews was conducted with 18 instructional leaders who had prominent roles in large-scale implementation programs designed to teach HOT. Most participants (n = 15) expressed the opinion that metacognition is valuable in teaching HOT yet, reported that metacognitive teaching is rare in wide-scale efforts to implement HOT. They explained that the major reason for this gap is teachers' fragile knowledge of metacognition. The analysis shows a deficiency in teachers' general metacognitive knowledge, deficiency in the more specific metastrategic knowledge (MSK) regarding individual thinking strategies, and deficiencies in relevant pedagogical knowledge. Implications are discussed.

Keywords: metacognition, higher-order thinking, professional development, teachers' knowledge of metacognition

1. Introduction

This chapter investigates challenges in addressing metacognition in large-scale professional development (PD) programs addressing instruction of higher-order thinking (HOT). The theoretical background will briefly address higher order thinking and metacognition and then turn to discuss teachers' knowledge and professional development in these contexts.

1.1. Teaching higher-order thinking

Many studies document the significance of metacognition for students' learning and achievements (e.g., see [1, 2].) The present study explores metacognitive instruction in the area of teaching higher order thinking (HOT). In general terms, HOT refers to cognitive activities that are beyond the stage of recall and comprehension/understanding, according to Bloom's taxonomy [3] and according to more recent revised models [4, 5]. Applying analyzing, evaluating, and creating are key elements at the HOT level. Examples of cognitive activities that are classified as HOT also include constructing and evaluating arguments, asking research questions, dealing with controversies, making comparisons, designing, controlling variables, drawing conclusions, corroborating information sources, and establishing causal relationships [6]. The underlying assumption of this chapter is that HOT must be taught according to the infusion approach, that is, to be integrated with the content and rich conceptual frameworks of the various school subjects [6, 7].

Despite numerous projects aimed at fostering HOT, most classrooms worldwide are still predominately characterized by pedagogy of knowledge transmission that focuses on lower-order cognitive levels. Several researchers note that scaling up the "thinking curriculum" is a huge challenge that is still awaiting educational systems all over the world [8, 9]. These studies show that we still need to explore new ways to implement HOT in schools. Metacognition is essential for such implementation efforts.

1.2. Instruction of metacognition as part of programs designed to teach higher-order thinking

There is ample evidence showing that metacognition has a crucial role in learning and instruction of HOT. In order to explain the intersection of these two concepts, a brief overview of the concept of metacognition is called for. Flavell and his colleagues [10] distinguish between two major components of metacognition: metacognitive knowledge (MK) and metacognitive monitoring and self-regulation. Many researchers also refer to the latter component as metacognitive skills (MS).

Metacognitive knowledge (MK) refers to knowledge, beliefs, ideas, and theories about people as "cognitive creatures" and about their diverse interactions with cognitive tasks and strategies [11]. MK includes three subcategories: knowledge about persons, tasks, and strategies. In the context of teaching HOT, knowledge of tasks and strategies is particularly significant. Kuhn views strategy and task knowledge as interrelated subcomponents of *metastrategic knowledge (MS)* [12]. Metastrategic knowledge, as defined by Kuhn, entails knowledge about what thinking strategies can accomplish, about when, why, and how to use these strategies, and about the goals and requirements of tasks [12, 13]. *Metacognitive skills (MS)* are the skills and processes used to guide, monitor, control, and regulate cognition and learning. For example, Schraw and Moshman [14] point out three essential skill categories: planning, monitoring, and evaluation.

Many methods for teaching HOT embrace metacognition as a crucial component of instruction (for a review see [15]). In order to understand the importance of metacognition

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in teaching HOT, let us consider a successful execution of a HOT strategy in science education, for example, variable control. When designing an experiment, students need to know that the task *requires* variable control, to understand *why* variable control should be used (e.g., that without it inferences will be invalid), and to know *how* to control variables (e.g., to change only one variable at a time while keeping the other variables constant). These are components of metacognitive knowledge regarding the when, why, and how of performing the strategy. Alternatively, using the terminology presented earlier, we can say that these components consist of MSK about variable control. However, in order to actually control variables during their experimentation, students also need to plan their actions in a careful way, to monitor their actions in order to see if things are going according to plan, and to evaluate whether they have indeed controlled variables correctly and if their inferences are valid. This evaluation may lead the students to conclude that they need to design a new and better experiment. That is, successful execution of a HOT strategy also requires MS such as planning, monitoring, evaluating, and regulating.

Both theoretical and empirical studies support the significance of metacognition for instruction of HOT [15]. The claim that increasing students' MSK enhances strategic thinking implies that it may be fruitful to try teach that knowledge rather than wait until it develops spontaneously. Addressing MSK in the classroom often amounts to helping students see the general thinking structures embedded in the "messy" domain-specific situations they are dealing with. For instance, students may not see any connection between an inquiry activity they are doing in class in the subject of seed germination and an inquiry activity they did a month earlier in the topic of force and motion. The teacher, however, can explicitly point out that both activities share the same features of the inquiry cycle and that the rule they had learned regarding the need to control variables applies in both cases. Using explicit general knowledge pertaining to MSK in teaching thinking is therefore a type of "bridging" activity that may enhance transfer [16].

Metacognitive skills (MS) also make substantial contributions to students' thinking. In order to control and regulate their thinking, learners employ MS that draw on their MK regarding cognitive processes [14]. For example, learners need to plan, in the sense that they need to choose which HOT strategy to use among several available strategies, based on task demands. Then they need to monitor and regulate the use of that strategy.

1.3. Teachers' knowledge in the context of teaching HOT and metacognition

A deep knowledge of the principles of the educational reform highlighting HOT and metacognition is necessary for successful and thoughtful enactment. Such knowledge must go beyond the acquisition of a fixed set of teaching skills [17], otherwise, teachers will revert to a "mechanical" way of teaching that may preserve external elements of the reform while ignoring its deep core. In the context of the present chapter, the main thing is that teachers need to be highly proficient with specific knowledge that pertains specifically to teaching HOT and metacognition. Like in any other field, in order to teach successfully, teachers need familiarity of whatever it is they attempt to teach as well as sound knowledge of how to teach it. In order to delineate the unique nature of HOT and metacognition, Zohar [6, 15, 18] suggested

that teachers' knowledge in this context can be addressed using the terms: "knowledge of elements of thinking and/or metacognition" and "pedagogical knowledge in the context of teaching HOT and/or metacognition." These terms highlight the fact that teachers' knowledge in this field has unique characteristics and is both domain general and domain specific (for a more detailed explanation, see [15, 18]).

A precondition for teachers' metacognitive knowledge in this area is their familiarity with thinking strategies and processes on the cognitive level, that is, with **knowledge of elements of thinking**. In addition, previous researchers noted that in order to use metacognition successfully when teaching HOT, teachers need robust knowledge of **elements of metacognition**, that is, of the pertinent **metacognitive knowledge and skills** related to HOT [19, 20]. Moreover, the domain-specific aspects of **metastrategic knowledge (MSK)** suggest that teachers may need diverse types of MSK for the diverse thinking strategies they would address in class. Teachers obviously also need to be proficient with the **metastrategic skills (MS)** that are relevant for planning, monitoring, evaluating, and regulating thinking processes in the area of HOT. Such complex knowledge of metacognition is a precondition for sound **pedagogical knowledge** in this area. Zohar and Barzilai [15] further elaborated the component of the pedagogical knowledge noted earlier, describing several pedagogical principles, two of which are particularly significant for the present chapter: (1) deliberate attention to general thinking structures and skills, and (2) fostering explicit awareness of metacognition in the classroom.

Despite researchers' agreement about the value of teachers' knowledge about metacognition, studies show that in effect, the knowledge of most teachers in this area is slim [1, 20–27]. Teacher education programs may cultivate that knowledge using multiple means. For example, while small groups of student-teachers engage in problem-solving, one member of the group is asked to record the thinking strategies her peers have been using during that process. At a later stage of the lesson, this member of the group shares the data she recorded, thereby making the thinking strategies explicit and an object of discussion and evaluation. Other examples may consist of watching and analyzing a video of a lesson in which the teacher applied metacognitive teaching or of a task presenting a thinking-rich lesson plan, and then asking student-teacher to add metacognitive components to the lesson.

2. Method

2.1. Research questions

The present study aims to answer the following research questions:

1. How do educators who lead wide-scale programs aimed at the development of students' higher order thinking (HOT) view teachers' knowledge in the area of metacognition?
2. How do they view the impact of teachers' knowledge on the implementation of metacognition?

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2.2. Methodology

This is a qualitative study based on in-depth, semi-structured interviews with 18 instructional leaders who had prominent roles in large-scale implementation programs designed to teach HOT. Data analysis applies a pragmatic qualitative research approach that is particularly suitable for professional fields because it provides the descriptive information that can inform professional practices [28]. The research conducted within this approach is just what the name implies: research that draws upon the most sensible and practical methods available in order to answer a given research question. It aims for description of experiences and events as interpreted by the researchers, and therefore marks the meeting point of description and interpretation, in which description involves presentation of facts, feelings, and experiences in the everyday language of participants, as interpreted by the researcher. Analysis typically consists of qualitative content analysis using modifiable coding systems that correspond to the data collected. Interpretation stays close to the data [28].

2.3. Participants

Participants in this study are 18 educators, each of which had a prominent role in leading a comprehensive, large-scale change process that aims to foster students' HOT by implementing thinking-rich instruction. Eight participants are (or were until recently) National Subject Superintendents who are responsible for curriculum development and implementation, for professional development, and for assessment in a specific school subject across the whole school system. Four participants have (or had until recently) prominent roles in the development and implementation of programs in the area of teaching HOT on the national level, and three participants had a similar role on the district level. Two participants have leading pedagogical roles in a large school network, and one participant is an academic who has been deeply involved in national efforts to improve learning and instruction in a specific school subject. Because all participants are well-known educators who could easily be identified and because confidentiality was promised to the participants, all details (such as names of programs or subject domains) were omitted from the quotations used throughout this chapter.

The selection of participants applied the following criteria:

1. At least two years of experience in leading a wide-scale pedagogical change process that is closely related to instruction of HOT.
2. Intense involvement in leading the pedagogical sides of the change process (rather than leading only its administrative sides).
3. Developing students' HOT is an explicit and central goal of the change process.

2.4. Interview

The semi-structured interview protocol consisted of 13 core questions and numerous examples of follow-up questions to be asked according to need, for deeper probing into participants' initial responses to the core questions. The core questions addressed the following

issues: a general description of the program, the strategies used for wide-scale implementation, main barriers and challenges, professional development, the development of learning materials, assessment, the suitability of the program to diverse learners, and whether the program involved metacognition.

2.5. Data collection

Data collection took place between January and October 2015. The interviews were between 90 and 120 min.

2.6. Data analysis

Both researchers read the full interview transcripts (referring to all 13 questions) numerous times and wrote down initial codes for each segment. Data reduction took place by creating a file ("the metacognition file") that consisted of the full responses to the metacognitive question (#10) and all the segments from responses to other questions that belonged to the "metacognition" code.

Then both researchers read the metacognition file numerous times and coded it to create thematic sub-files that were then analyzed using a narrative approach.

3. Findings

Our findings show that 15 of the leaders we have interviewed recognized the value of metacognitive teaching in learning and instruction:

> *We really really want to be there [i.e., to engage in metacognitive thinking]. We are aiming at it. We want very much to be there.* (#7).

> *I wish, I wish it [i.e., metacognition] would have been implemented in all schools.* (#17).

> *Metacognitive processes are really important… Because at the moment you are engaging in a metacognitive process you secure the strategy and you make it possible to transfer it to another domain…/ You need it [the metacognitive process] in order to acquire a thinking skill and to transfer it from one domain to another.* (#2).

Yet, although the majority of the participants recognized that metacognition is indeed valuable for their program, only four of them reported that their programs currently apply metacognitive teaching in classroom learning and instruction. A number of participants reported that metacognition is part of their PD. Participants reported that the major reason for the unsatisfactory implementation of metacognition was teachers' fragile knowledge.

3.1. Teachers' fragile metacognitive knowledge

In total, 15 interviewees noted weaknesses in teachers' knowledge regarding metacognition, referring to two different elements: knowledge of metacognition and pedagogical knowledge

concerning how to teach metacognition. Participant #4 noted that teachers are ill-informed in this area and don't know how to apply metacognition in the classroom *(teachers did not understand it at all)*. He continued by explaining that:

> *This whole idea of metacognition is something you really need to understand. That students actually need to think about what they are doing, before, while and after [engaging in a thinking task]. This whole thing… It is something that [teachers] first need to study, to understand from a theoretical point of view, and then to connect it to whatever they do….*

In her response to a question about metacognition, participant #14 noted that:

> *Earlier this year I gave a talk in a professional development workshop for "X" teachers ["X" stands for a particular school subject]. I was shocked to discover that although it appears in the textbook [for students], some teachers don't know anything about it.*

Participants also addressed the type of knowledge teachers need in order to apply metacognition in class. Although they did not use the concept "pedagogical knowledge in the context of metacognition," they had in effect referred to the meaning of this concept and to its relationship to metacognitive knowledge, expressing the idea that teachers must first gain metacognitive knowledge before they can start teaching it:

> *….The teacher needs to understand the process before she starts teaching it….* (18).

> *I think teachers did not feel confident in this area… They did not… and even those who did try to…/ It was not based on comprehension…/ You cannot engage in metacognitive thinking on a process that you do not really and truly understand… or that you are fully clear about… And that you are deeply involved with and you know what it entails… What it means from an instructional point of view….* (#15).

> *They don't teach metacognition in the relatively simple way metacognition appears in the teaching unit…. Teachers themselves don't know how to use it….* (#14).

Participants therefore see teachers' fragile knowledge of metacognition as an inhibiting factor in their ability to teach metacognition, even when they are using learning materials that were specifically designed to teach metacognition and even when such learning materials are rather simple.

3.2. Teachers' fragile metastrategic knowledge

The present study discusses metacognition in the context of teaching HOT. It is important to note that the data are based on participants' testimonies and statements rather than on direct observations. Under these circumstances, participants explicitly addressed teachers' lack of knowledge concerning MSK of thinking strategies. Participant #1 explained that the matriculation exam in the subject she is responsible for includes HOT items. These items ask students to use thinking strategies (on the cognitive level) and then to reflect on how they have solved the HOT items by noting (1) **which** thinking strategy(ies) they have been using to solve the HOT items and (2) by explaining **why** they chose to use precisely this particular thinking strategy. This reflective part of the item corresponds to MSK. Students receive a list of thinking strategies, so that in order to answer section (1) of the question all they needed to do is to choose the name of the appropriate strategy from the list. Yet, interviewee #1 reported that **teachers** who

participated in a PD course initially found this task (taken from the matriculation exam, and thus originally written for students) too difficult, indicating a weakness in their MSK:

> *There is a list. They don't need to remember by heart [the names of the thinking strategies]. [They need] to answer the question and then to explain, to justify how this thinking strategy helps…* ***and it drove teachers crazy because they could not answer this question… they didn't know and it drove them mad****. [original emphasis by interviewee].*

Participant # 13 also reported that the PD workshops revealed deficiencies in teachers' MSK. For example, when a workshop engaged teachers in making comparisons, they immediately noted specific differences and commonalities between the objects they compared, that is, they had no difficulties using the HOT strategy of making comparisons on the cognitive/strategic level. They lacked, however, the knowledge of discussing comparisons on the general, meta-level that MSK consists of. Participant #13 asserts in an explicit way that during the PD workshops, there is a need to work with teachers on the construction of the MSK that the program addresses. This assertion indicates that teachers were not proficient in using MSK prior to their formal learning in this area. The next citation supports this conclusion:

> *We teach the teachers how to carry out a comparison, or a sorting task. If teachers don't know that- how will they know how to teach? You tell me. If the meta-strategic knowledge does not really sit well in their minds (1)? … They are not familiar with the thinking maps, or they are only partially familiar with them. Now, if a teacher is not familiar with the thinking map, it will also be very difficult for her to construct a teaching strategy because teaching strategies go together with the thinking map (2)….* (#13).

In this citation, participant #13 discusses teachers' missing MSK (1) in an explicit way. Her program uses "thinking maps" as graphic representations for MSK. She explains that teachers are unfamiliar with the MSK represented in the thinking maps (either completely, or only partially). Notably, she also established an explicit connection between teachers' MSK and their pedagogical knowledge for teaching HOT, explaining that the former is a condition for the latter (2). In other words, if teachers are not proficient with MSK, they will not be able to teach thinking effectively. Participant # 3 also expressed the same connection between the two components of teachers' knowledge:

> *It is important to me that the teacher himself will have the conceptualization of whatever it is [he is teaching]… It is very important to me that when a teacher enters the classroom and teaches he will be able to say to himself: Ahaa, what I did just now was to ask them to make a generalization.*

The conceptualization of the type of thinking (in this case a generalization) a teacher engages with in class, including the ability to use the "language of thinking" in terms of being able to name the strategy, is in effect MSK. In this citation, participant #3 therefore also addresses the connection between teachers' MSK and instruction, stating her belief that teachers' MSK is significant for instruction.

3.3. Mechanical knowledge

Six participants noted that because teachers lack the deep knowledge required for teaching metacognition in a meaningful way, they might adopt a "mechanical approach" in their

teaching. In Hebrew, the term "mechanical knowledge" is used to designate knowledge that is superficial and meaningless, allowing the knower to "hit" the right answer by carrying out routines that do not require thinking. These participants imply that in such cases, teaching thinking in general and metacognition in particular may cause more damage than benefit. It seems that by using the term "mechanical approach", the participants meant that teachers engage in superficial rather than deep facets of metacognition:

> *Teachers did not understand what it is all about. How they are meant to do it… And some of those who did [teach metacognition], did it in a very mechanical way.* (#4).

Participant #3 was apprehensive about a mechanical and shallow use of metacognition and more specifically of MSK. In the following citation, she expresses her aversion toward teachers and students who discuss what thinking skills they have been using in class and why it is important to apply particular thinking strategies when they do not really understand the concepts they are using:

> *I don't want it to turn into a mechanical language of students who will start to talk using slogans…/ This is why I really dislike that teachers bring into the classroom words that they don't really understand. You start saying [here the interviewee mimics a formal, pompous voice] - "Please pay attention. What we did now was to engage in strategies that teach the importance of argumentation", or that "what you just did is a generalization". If the teacher doesn't understand what he is talking about, it is preferable that he would not use that language. I don't want him to bring into the classroom words that he doesn't really know how to use.*

Participant #15 also addresses the association between mechanical use of a thinking strategy and lack of metacognition. She talks about a thinking activity in which students are presented with a picture and asked to ask questions about it:

> *…But if you are doing it mechanically… [moving to in a scornful voice] "OK, I was told I must look at this picture and ask questions" … [moving back to her normal voice] So where is the metacognition?*

Participant #18 also said explicitly several times that throughout the system HOT is used in a "mechanical" way on both the cognitive and the metacognitive level.

In summary, several participants brought up the idea of "mechanical knowledge" of metacognition, implying that in such cases, it may be better to overlook metacognitive teaching altogether than to engage with it in a meaningless and superficial way that may be harmful. It should be noted that additional participants (not cited here) also expressed apprehension from shallow knowledge without using the term "mechanical knowledge."

3.4. Professional development in the area of metacognition

3.4.1. Knowledge components addressed in PD

In total, 16 participants addressed the issue of metacognition in the context of PD processes. A few of these participants described in detail what goes on in PD workshops. The description informs us how teachers' learning processes handle metacognition in the context of teaching thinking. The interviews indicate that the PD workshops address all three knowledge components that are relevant for teaching metacognition:

1. **knowledge of thinking strategies**, that is, the workshop helps teachers in constructing their own knowledge about how to reason by using thinking strategies (on the cognitive or strategic level);
2. **knowledge of metacognition**, including both metacognitive knowledge and metacognitive skills; and
3. **pedagogical knowledge**, that is necessary in order to teach the components mentioned in (1) and (2).

For example, participant #4 describes the construction of MSK during PD but then proceeds to explain how teachers' MSK forms the foundation for supporting the development of pedagogical knowledge. Emerging from a concrete example embedded in the content of the lesson, she talks about the nature and role of criteria in a comparison (i.e., MSK). Then she says:

> *Which criteria would you put forward here so that the comparison would be worthy? (1) Would you present the criteria to the kids or would you ask* **them** *to propose which criteria they should use? (2) Because if the kids are on a higher level it is better if they choose the criteria by themselves (3)…/ What I am saying is that when you do something and you conceptualize it, you understand what you are doing. You can do it in a better way.*

Participant #3 addresses three pedagogical issues: (1) the teacher's need to choose wisely among the many possible criteria for comparing and contrasting precisely which criteria would it be best to bring up in class; (2) the degree of guidance the teacher needs to provide with respect to the thinking strategy: whether to let students discover the criteria by independent thinking, or to guide them how to construct the criteria?; and (3) the need to accommodate the degree of teachers' guidance to students' level. This is based on the (implicit) assumption that when students are on a lower level it is advisable to provide more guidance (and to present them with the criteria for the comparison), but when the students are on a higher level, it is advisable to let them discover the criteria on their own.

Additional interviewees repeated similar ideas.

3.4.2. Principles of addressing metacognition in teachers' workshops

Participants described several principles for working with teachers on the development of metacognition in the workshops. One recurrent theme was the significance of teachers' active learning.

More specifically, because the assumption is that most teachers are not experienced metacognitive thinkers, teachers' active learning makes it necessary that the workshops will provide opportunities for teachers to experience metacognitive thinking "as learners":

> *[Working on a thinking skill in the workshop] is not simply to come and lecture them about the skill. It's not about lecturing. Teachers themselves must experience it as if they were students, to go through the experience with all the metacognitive processes.* (# 13).

> *In principle, I think that the way we have been working most often with teachers is by some sort of mirroring movement… Teachers are going through processes that later on they will go through with their students.* (# 6)

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Another (related) principle is not to begin talking about metacognition in an abstract and theoretical way but to anchor discussions about metacognition in examples taken from specific topics teachers have been teaching. Participant #3 noted that she is apprehensive of starting to discuss the metacognitive aspects of thinking strategies in an abstract, theoretical way, because she feels that teachers find it menacing and alienating. She believes that metacognitive conceptualization must always begin with a concrete example. In other words, she prefers inductive to deductive discussion of metacognitive knowledge:

> *I always want it [i.e., metacognitive knowledge] to develop from an example that they will conceptualize. I mean my idea is that when you actually do something and then you conceptualize it – you understand what you are doing. You will do it better. Rather than- I will present you with a theory and we shall see how it can connect to reality. Because this approach does not work with teachers.* (#3).

3.4.3. Reasons for not implementing metacognition in classrooms

The scarcity of metacognitive learning in classrooms is not surprising when we look at the data concerning teachers' fragile knowledge. Most participants talked about the deficiencies in teachers' knowledge as the most prominent reason for not implementing metacognition in classrooms. The previous sections support this statement with ample evidence. Many of the excerpts cited in previous sections of this chapter imply the participants' belief that teachers' metacognitive knowledge and pedagogical knowledge in the context of metacognition is a necessary condition for metacognitive teaching and that in general, the pertinent knowledge of many teachers is too fragile to support such teaching. In addition, participants talked about their apprehension from shallow and "mechanical" teaching. That is, they believed teachers' superficial knowledge could only allow them to teach using slogans and fixed algorithms rather than flexible scaffolding of students' metacognitive thinking. Because they wanted to refrain from such shallow implementation of metacognition, they preferred to avoid metacognitive teaching altogether.

4. Summary, discussion, and implications

The findings confirm the findings of previous researchers [24, 26, 22] regarding a prevalent theory-practice gap in the area of teaching metacognition. As noted earlier, the data are based on participants' testimonies and statements rather than on direct observations. Yet, our findings show that educators who led wide-scale programs aimed at the development of students' HOT viewed teachers' knowledge in the area of metacognition as valuable for their program. Yet, only four of them reported that classroom instruction in their programs currently addresses metacognition. Participants reported that the major reason for the unsatisfactory implementation of metacognition was teachers' fragile knowledge of metacognition. Our analysis shows lack of teachers' general metacognitive knowledge, lack of the more specific MSK regarding individual thinking strategies, and lack of the pedagogical knowledge required for teaching metacognition. Some participants thought that the knowledge teachers had could have enabled them to teach metacognition only in a shallow or "mechanical" way. Such knowledge can facilitate routine teaching according to given scripts or fixed learning

materials but does not support the ability to respond to the unexpected events characterizing the teaching of HOT and metacognition in a flexible way. Many of the participants shared the apprehension of previous scholars who believe that without teachers' deep understanding of the intentions embedded in new curriculum materials, there is a danger of clinging to an innovation's external characteristics, while the essence of the reform might be lost in the adaptation process [17, 29, 30]. Because they saw this potential risk as a serious menace, many participants thought it was better to avoid any metacognitive teaching altogether than to engage with it in a distorting "mechanical" way.

Participants also described several principles for working with teachers during PD. One recurrent theme was the significance of teachers' active learning, including a need that the workshops will provide opportunities for teachers to experience metacognitive thinking "as learners." Another (related) principle is to anchor discussions about metacognition in examples taken from specific topics teachers have been teaching rather than to discuss metacognition in an abstract and theoretical way. The data thus show that it is possible to address metacognition in large-scale implementation processes, but unfortunately, it does not happen frequently. Teaching metacognition is not common in wide-scale efforts to implement HOT and thus remains an unresolved challenge in the implementation of most programs.

The main implication of this study is an emphasis on the need to develop practical and user-friendly, yet not "mechanical," ways to foster the knowledge teachers need in order to teach metacognition in programs designed to teach HOT. Teachers PD in programs that foster students' HOT need to cater to both theoretical knowledge pertaining to metacognition and to the pedagogical knowledge required for teaching it.

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Chapter 7

Preparing Educational Hackers

Maya Wizel

Additional information is available at the end of the chapter

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Abstract

As technology creates change at a faster pace than ever before, education battles to remain relevant. With no one right way to design schools, some teachers are *hacking*—that is, acting innovatively—in the public K-12 system. This chapter discusses a qualitative research aimed at examining characteristics and conditions under which teachers hack their classroom pedagogy in disruptive innovation, emphasizing the study's implications for teacher education. Participants were eight public school teachers from Massachusetts with more than 1 year experience in the profession, working in the classroom at the time of the study, and demonstrating pedagogic innovation. The results show recurring notions connected to teachers as hackers, their professional identities, the ways they act, and common characteristics of idealism, motivation, reflection, adaptation, and resourcefulness. The framework of *hacking* to describe innovative actions of public school teachers adds to existing terminology and offers a fresh lens through which to view and re-structure teacher education. The recommendations can serve as a north star for preparing teachers to reform the twenty-first century public school system from within.

Keywords: innovation, hacking, teacher education, risk-taking, educational revolution, change

1. Introduction

The public education system has always struggled to keep pace in the changing world. In the twenty-first century, as technology creates change at a faster pace than ever before, education battles to remain relevant. In such an environment, with no one right way to design schools, some teachers are *hacking*—that is, acting innovatively—in the public K-12 system.

A few presuppositions guided this research: (a) The world has changed and the public education system should change accordingly, (b) there is no single way to design schools in the

twenty-first century, (c) teachers should change the public K–12 education by creating disruptive innovation in pedagogy, and (d) teacher education should play an important role in preparing teachers to lead the educational revolution.

Several terms, such as leaders or change agents, have been used to describe teachers who take initiative and change their teaching practices. When the term leadership is applied to schools, it most often refers to teachers who accept additional formal roles, such as mentoring new teachers or leading team meetings [1, 2]. Another frequently used term, teachers as change agents, represents teachers who influence others in the organization through their actions [3]. I present a new term, *teachers as hackers*, to describe the actions of teachers in the K–12 public system who reform and act innovatively in their practice without such formalized leadership or administrative role.

The term hacker often suggests someone who seeks and exploits weaknesses in a computer system or network. During the past decades, the term has had meanings both negative—referring to criminal activity—and positive, in the sense of using playful cleverness to achieve a goal. In other words, "hacking is simply taking something—like an object or idea—and changing it to fit one's own need," ([4], p. 1). Along with the positive meanings comes the term *hacker culture*, which combines excellence, playfulness, cleverness, and exploration in performed activities [5].

In this positive context, teachers' innovative behavior that has the power to reform the public education system can be described as hacking schools. Hackers tend to find weaknesses, create solutions using existing resources, and collaborate with others. They are passionate professionals, enjoying what they do [6]. Thus, this notion of hacking can relate to teachers who continually look for ways to reach their pedagogical goals and act accordingly, and are playful and passionate about their work.

This chapter discusses a qualitative research aimed at examining the characteristics and conditions under which teachers hack their classroom pedagogy to create disruptive innovation in the public education system, [7] and emphasizes the study's implications for teacher education. The study's recommendations can help policymakers and higher education leaders transform teacher education programs to better prepare teachers to reform the twenty-first century public school system.

Teacher education has become a central concern nationally and internationally as many countries pay increased attention to teacher quality and preparation [8–11]. In the context of this chapter, *teacher education* refers to the teacher preparation that occurs before teachers enter the workforce. This may include traditional four-year college preparation, as well as alternative programs inside or outside higher education institutions. It can be a program for novices or for career changers. Being innovative in teaching regards introducing new practices or methods of teaching, assessment, or communication. The innovation usually includes risk-taking and entrepreneurship on the teachers' part, meaning it is innovative for the teachers individually or in their environment.

The goal of the research discussed in this chapter was to obtain a comprehensive understanding of the experience of public school teachers who act innovatively in their classrooms and broaden understanding of innovative teachers in public schools [7]. Abundant material in

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the literature addressed *obstacles* to change in the public education system; [12–14] this study focused on *opportunities* to change and learn from teachers' success stories. As such, this chapter addresses the research questions: *What are the characteristics and circumstances of teachers who hack the pedagogy in their classrooms? What lessons for teacher education can be adopted from teachers who hack?*

2. Teachers as hackers

2.1. Method

Answering the research questions required understanding of the complex experience of innovative teachers that qualitative research methods provide. Questionnaires were used as a pre-interview screening for participation criteria and to obtain background information prior to the interviews regarding participants' higher education, professional experience, teaching certifications, and current work. However, semi-structured interviews were the main data collection tool. A university internal review board approved all research procedures, including consent forms, questionnaires, and interview questions.

The study participants were eight public school teachers from Massachusetts who met all selection criteria, including more than 1 year experience in the profession and working in the classroom at the time of the study. Most significantly, all participants met the criterion for demonstrated pedagogic innovation. They had explored new ways to teach or incorporate nontraditional methods such as innovative class design, project-based learning (PBL), new assessment tools, interdisciplinary perspective, or technology integration into their teaching. These innovative actions and pedagogical explorations were individual efforts and not part of a broader reform. For the final criterion, all participants perceived the experience as successful. The sample was diverse, with participant teachers from a variety of school environments, subjects, professional backgrounds, ages, and years of teaching experience.

The interviews took place in the participants' workplace (schools), lasted 60–90 minutes each, and were audio recorded. Following the interviews and the transcription process, I uploaded the data to NVivo software to support data analysis. Adaptive grounded theory inspired the analysis, and I approached the data with no prior coding or categories and with an open mind regarding potential findings. I coded each transcript and added codes as needed. I read each transcription several times, immersed in the data, then coded, re-coded and arranged the codes in thematic groups. For example, I grouped codes regarding time, space, and support under the theme, *resources*. Further, I conducted progressive analyses such as text searches, matrix coding, and word frequency using the software to look for additional findings.

2.2. Results and discussion

The results showed recurring notions connected to teachers as hackers, their professional identities, the ways they act, and their common characteristics. **Figure 1** lists the skills and habits of teachers who act as hackers identified in the findings.

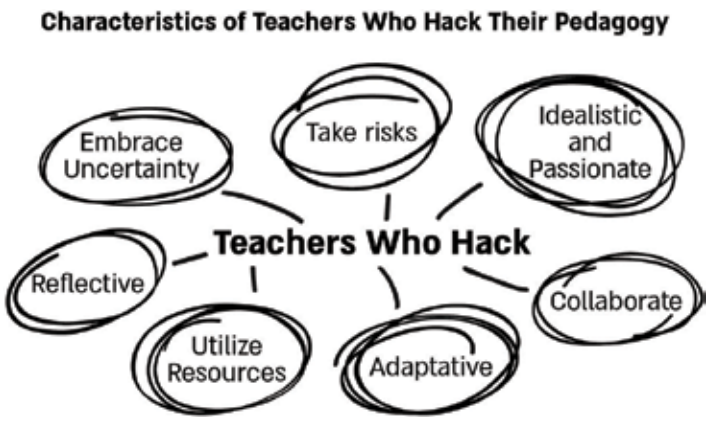

Figure 1. Skills and habits of teachers who hack.

Teachers who hack had personal traits and habits such as reflection and risk-taking and used their diverse backgrounds to influence their practices. They were highly motivated to improve their teaching processes. Unsatisfied with being "just" good teachers, teachers who hack were driven to explore new ways of practice. In this process of exploration and improvement, they took risks and wisely used the resources around them to reach their goals. They reflected on their accomplishments, accepted failure as part of the improvement process, and acknowledged the endless possibilities technology offers when it comes to changing their pedagogy.

Teachers who hack were willing to act in uncertainty and accept that there are many possible answers to the question of how education should be conducted in the twenty-first century. They were driven to share their new pedagogy with others inside and outside their schools, even when they faced challenges doing so. They appreciated the support of administration, the organizational culture of collaboration, and the importance of available resources such as time, technology, and space.

The study findings have meaningful implications for teacher education. Awareness of the habits of teachers who hack identified in the study can help designers of teacher-education programs reframe and modify curriculum and structure choices to promote opportunities for future teachers to hack their pedagogy. Thus, based on the mental habits and concrete practices of teachers who hack, I established guiding elements and recommendations to address questions and dilemmas regarding teacher education programs and integrated these recommendations in the following discussion.

2.2.1. Idealism and passion

> *I want to help people integrate technology. I feel passionate about it, like I want the kids to have these experiences.*

Teachers who hack their pedagogy were passionate, idealistic, and opinionated. They loved the profession. As a veteran teacher participant acknowledged, "The longer I've been here, the longer I love it. It's not going down; my love for it is increasing, my desire." With strong

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feelings and beliefs regarding the role of education in society, these teachers cared about issues at the heart of the educational debate, such as common core or testing, and the ways they expressed concern demonstrated their emotional investment. For example, one participant showed emotional investment, saying, "It was this factory-model thing driving me nuts." They also tended to be involved in issues outside the classroom, such as the role of education in social justice issues such as education for underprivileged kids, race, and gender.

In his book, *The Element,* Robinson wrote about how finding passion changes everything [15]. The concept applies to teachers. Preparation programs should help students find their passion and purpose, devoting time and effort for them to identify and understand what they care about—from sustaining good writing skills or special education to social justice and environmental issues.

The teacher-preparation process should encourage future teachers to deal with philosophical questions and critical thinking regarding the role of public education in society [16]. Programs should encourage students to form their individual identity as educators and answer questions such as, *Why am I a teacher?* This process need not conclude at the end of the program; it is a beginning, familiarizing students to a habit of thinking about higher goals. Teachers who care deeply about education will be more motivated to choose public systems, change it from within, and stay in the profession.

2.2.2. Motivation and background

> *I have an innate desire to compete and be the best at the thing I am trying to do.*

The findings indicated that participants frequently raised issues related to motivation—motivation to enter the profession and motivation to act innovatively and hack their pedagogy.

In the study, four participants' first profession was teaching and four were career changers. A 23-year-old teacher explained he entered the profession because his teachers had influenced his life: "I became a teacher to make these kids feel like they are successful in something; to make them feel like they're loved. And they want to be better people." Other reasons participants gave for their career choice included the influence of parents and experiences from other educational settings such as summer camps. All four participants who had changed careers to enter teaching described a time in their lives when they realized teaching would allow them to feel more meaningful or more satisfied. For example, a participant who had been an engineer unhappy with that work realized the part he most enjoyed was training others—and then realized teaching children might be a better fit for him.

Participants also emphasized their motivation to act innovatively. One teacher described it as "wanting to be at the cutting edge and then always wanting to be doing something different and interesting that's going to push my thinking." In addition, participants shared that a reflective process regarding their educational goals—and even failure to reach those goals—was a source of motivation to explore new paths.

The hacker profile contemplates the desired profile of teachers accepted into teacher education programs and later to public schools. The application for teacher education programs

should identify candidates with personal traits and life experiences that can help them become hackers: individuals who demonstrate passion for education and motivation for social justice causes, who define themselves as creative and thinking outside the box, who have experience learning in nontraditional schools or with technology, and so on. Schools of education should broaden the spectrum of applicants and encourage candidates with diverse background to contribute their unique perspectives and skills to the teaching force. This recommendation aligns with the goal of U.S. public schools to diversify faculty by all means [17–19].

Another focus should be on career changers who enter teaching after starting their professional lives in another occupation. My study supports previous findings that showed the personal qualities and attributes career changers bring to the profession are likely to improve the quality of teaching and student learning. For example, Williams and Forgasz supported recruiting career changers in Australia because these teachers bring attributes such as maturity, life experience, work knowledge, skills from other professions and industries, and high levels of motivation that supplement those school leaders bring to teaching [20]. Teacher education programs should continue to create opportunities for career changers to enter teaching and consider what they need in their pre- and in-service training.

Study participants who had changed careers to teach stated it took them time to realize that some skills they acquired at other settings were relevant in schools. Previous research also indicated that teachers who enter the profession with a broader understanding of the goals of public education or a love of children perform better at their jobs [21]. Even first-career teachers participating in the study commonly referred to their previous educational experiences such as summer camps or volunteering. Jarvis perceived the individual as a "whole person made up of the mind and the body [who] comes to a learning situation with a history, a biography that interacts in individual ways with the experience that generates the nature of learning," ([22], p. 101). From the perspective of adult-learning theories, individuals reflect mostly on the highly structured learning that occurs in classrooms or workshops but also have much to share about learning in informal settings. Teacher preparation programs should design strategies to allow students to bring their unique perspectives, habits, and skills from previous experiences into the conversation.

2.2.3. Teacher education pedagogy

> *It's good for students to see adults grappling with problems like that…As a kid, I thought teachers just knew everything.*

Relatively new terms such as *online learning*, *blended–hybrid*, and *web-facilitated* environments have become part of the education jargon [23]. Teachers are expected to work and teach with new pedagogies such as project-based learning (PBL), self-directed projects, paper-free classes, and blended-learning teaching. The new pedagogies emphasize the importance of real-life learning, an interdisciplinary approach, and the use of technological tools to promote deep learning [24].

Study participants detailed the pedagogical hacking they initiated in their classrooms. A high school social studies teacher transformed her classes to be flipped and paperless. An

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elementary school art teacher shared her interdisciplinary teaching, integrating science with art projects. A second-grade teacher in an urban school used mindfulness to support learning and classroom atmosphere. These teachers invested time and effort to look at a problem, learn, and explore new ways to approach their teaching. One participant explained, "I really believe in not doing the same thing twice. So, this lesson we didn't do last year, and I probably won't do it for another couple of years if I do it again—but there's definitely a hundred things I will change about it." Another participant added the issue of providing twenty-first century skills, saying when students memorize something, "that's not education. That was education 1839, when our industrial revolution started. But it wasn't—it's not—education now."

Such scenes of experimenting with new pedagogies and technology, however, are less common in higher education classrooms than in K–12 schools. Many programs for teacher education are still steeped in traditional methodology, which designates mandatory courses and electives in structured pathways that do not reflect the vision for twenty-first century schools. Instead, programs should incorporate more of the new ways of teaching that already exist in the K–12 system. These new methods allow student teachers to own their learning though independent studies and to experience as a student what it means to learn in a dynamic environment [25]. For example, students develop new skill sets while working on a project with other team members. They learn the benefits and limitations of PBL, behaviors to help coach and support students, communication skills, and other lessons such as dealing with conflict and failure [26]. Without such individual experiences, teachers who will teach using PBL will lack comprehensive understanding and, later in their careers, have a harder time leading their students.

Another example is blended-learning or hybrid courses. Programs should use technology to expose student teachers to various ways of teaching using the opportunities technology provides. Students participating in a blended-learning course will gain a much better sense of what is important, the structure of this teaching method, and ways to use opportunities to overcome the challenges inherent in online teaching. Updating teaching and program structure to mirror better what happens in schools will help student teachers face the obstacles. As Darling-Hammond and Bransford expressed, teachers who grew up learning traditionally and then were trained traditionally are still capable of changing their mindsets [27].

Among other priorities, participants stressed the importance of pedagogy that is relevant and connected to real life. They created learning experiences that encourage students to relate what they learned in real-life settings and designed opportunities to get away from the school and connect with experts in authentic work environments. The same should apply when looking at teacher education programs.

2.2.4. Field-based work

Most ($n = 6$) participants stressed the importance of being in the field and interacting with students and teachers early in the training process, and 45% of their comments regarding teacher education connected to being in the field. Three teachers described their fieldwork as the most meaningful part of their teacher-development training. One stated, "The most valuable, adaptive moments—my ability to adapt—came from working with kids. You can't help kids until

you understand their thinking, and that doesn't come from a book. It comes from working, interacting, with a wide variety of students as much as you can." Participants also related time in the field to other program aspects, such as training teachers to set realistic expectations. As another participant described, "They need to be in the schools all the time. Too many people don't realize what they're getting into."

These results correspond with the literature that recognized the central and crucial role of fieldwork—time spent in schools and in classrooms [28–31]. Common expressions in the literature to describe field-based learning, *practicum*, or *student teaching* in teacher education included *key factor*, [32] program *capstone*, [27, 33] *culminating experience*, [34] *very important*, [35] *critical element*, [36] and *the bridge* between preparation for teaching and the beginning of a teaching career [37]. All of these expressions indicate the central role attributed to this method of training future teachers, which can play a significant part in developing future teachers' sense of engagement with and commitment to the process of reforming the public education system. The practicum is also expected to support teacher retention and to help novice practitioners adjust better to the profession. This experience can serve as a crucial period of teacher-identity construction with a possible change in self-perception and professional identity and, thus, can support constructing professional identities of teachers as change agents.

In my study, the teachers who hack also shared that their mentors inspired and led meaningful learning and development experiences. Programs should structure meaningful time in the field accompanied by mentoring, support, and reflective practice. The mentoring should be well structured to provide opportunities for risk-taking and support exposure to progressive educational models [31]. Based on my study results, I highly recommend residency models that offer a full year in the field [38] or programs that take place entirely in schools.

Preparation programs should seek to place students in different schools and educational environments committed to discussing questions concerning their role in the twenty-first century public system. Experience in an array of classrooms and public, private, and independent schools can offer future teachers an opportunity to reflect about different ways to teach and practice schooling. Exposure to as many teaching styles and teaching roles as possible is a key factor. Such preservice experiences can also solve the issue of in-service teachers who, due to scheduling or workload issues, rarely find the opportunity to visit other schools and be inspired by them. In the study, three participants stated they had directed their own training by choosing different programs or selecting their practicum sites. One teacher shared that she received special approval to do a practicum with a teacher she liked but who had less than the required 3 years of experience. She explained and justified her choice: "I was like, that's the person I want to learn from." Thus, programs should allow greater freedom to student teachers who drive their own learning and development, allowing them to locate the right learning environment that fits their developmental needs.

Teacher education programs can and should serve as models, as real-life examples of the different methods of teaching and learning—teaching by using the methods they teach—as well as catalysts for reform in the K–12 educational system. The pedagogy of teacher preparation programs should model the one desired at the elementary and secondary levels—one that is relevant, engaging, and includes skills that will become germane later. Creating a teaching

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culture that leads the way for innovation and creativity is important in any higher education program but has an especially crucial role when preparing the next generation of educational leaders.

2.2.5. Reflection

> *That is where I think my philosophy in education started to change, because I hated the way I was teaching it.*

Teachers who hack continually reflected on their goals, methods, and progress. Their reflection identified gaps between the present and desired future, detected problems, and explored different means to approach problems. As one teacher described openly, "I'm still battling my traditional teacher self." Teachers who hack devoted time to learning and acted to improve practices and outcomes. In this, my study results are consistent with the literature, which strongly recommended reflective practice as part of teachers' learning and development, and which was supported by adult learning theories [21, 39, 40].

Darling-Hammond and Bransford emphasized the importance of reflection to the learning process because it helps student teachers find alternative strategies for the future and to solve problems [27]. Boz and Boz found that encouraging student teachers to reflect on their teaching and identify their strengths and areas for development within reflective practice was essential to learning [35]. Reflection enables future teachers to recognize the limitations of their personal assumptions, acknowledge other perspectives, consider the moral and ethical consequences of choices, and clarify the reasoning processes involved in making and evaluating decisions [40]. Reflection can also support student teachers to think about the different ways of practicing quality teaching and to examine innovative models for teaching other than what they had experienced so far [27].

The habits of reflection and critical thinking can be learned, applied, and accomplished. Teacher preparation programs should help prospective teachers develop the habit of reflecting by using structured assignments that require students to apply critical thinking and reflection to their own practices or to others they experience during fieldwork. Any segment of a teacher education program can incorporate the critical thinking skill of looking for gaps or problems. It does not require a special course; it requires special attention. Every subject future teachers should know can be processed thought the lenses of critical thinking and reflection. For example, reflection regarding field observations might include a segment to help student teachers look at problems in the field and think of possible solutions. Student teachers can be asked to create their teaching identity, asking themselves questions such as, Why am I here? What benefit do I bring? What is meaningful about me that I want to bring into teaching?

Increasing the number of reflecting episodes and enhancing their depth will help future teachers adopt this way of thinking and carry it into their daily teaching routines. "Institutions that, in general, encourage the teaching methods and the process of modeling devoid of any historical context or at philosophical base that would encourage critical reflection and that would lead students to ponder what worked. What did not, and why?" ([16], p. 358).

Reflection and continual assessment can be accomplished both individually and as part of an organizational culture that supports collaborative reflection [41]—devoting time to it and valuing teachers who reflect and share their contemplations.

2.2.6. Adaptation (uncertainty, flexibility, and risk-taking)

> *As I get older, I realize that I do not want to subscribe to anyway one form of thinking.*

In my study, participants expressed adaptation mainly regarding willingness to take risks, handle or even invite uncertainty, and flexibility. Teachers who hack in school expressed tolerance of uncertainty in many occasions and provided examples that demonstrate it. A teacher who was exploring PBL said, "I love the idea,…everything about it. But there's nothing out there that really shows me what to do." In an ever-changing world, those teachers embraced the understanding that today's methods might be not relevant tomorrow and "that's OK." Participants discussed flexibility in two ways, first referring to the amount of freedom schools give teachers in deciding what and how they teach and second, addressing their ability to react to changing situations and conditions. The teachers were not expecting linear changes and welcomed the process itself. One teacher shared, "It's like you plant this little seed….I don't give tests, nothing happens. The sky hasn't fallen, kids are happy."

Darling-Hammond and Bransford also emphasized that teachers should be prepared to become "adaptive experts" who develop skills and knowledge continuously [27]. Khan referred to embracing uncertainty as the constant adaptation and acceptance that is the nature of teaching and learning today [42]. Indeed, to create change, one should avoid the status quo and "shake" the system [42, 43].

Teacher education programs should communicate to students that this uncertainty is part of the nature of the profession. Teachers work with individuals; no days will look the same and no lessons can be taught exactly as planned. Understanding this can liberate new teachers and support them in adopting a hacker identity.

Seven of eight participants spontaneously brought up the subject of taking risks, indicating they perceive this to be a central issue. One participant explained, "A lot of people I have interacted with feel worried about like, 'What if I do something wrong?' where[as] I definitely grew up thinking you just try it and if it doesn't work, you try something else. You have to actually be quite confident in your ability to fail at things." Another participant added that to be an innovator, "you have to be willing to fail in public." This willingness to admit failure dominated, as most (n = 6) participants described their own failures.

The risk-taking concept and behavior was also well connected in the results to themes of pedagogy, innovation, and failure, making it an important characteristic of being an educational hacker. In addition to a personal inclination toward taking risks, this behavior seemed connected with experience and professional confidence. Risk-taking was not traditionally considered a quality of good teachers; nevertheless, it dominates in theories of change [44]. Robinson shared the story of Suzan Jeffers, who wrote the book, *Feel the Fear and Do It Anyway*, showing that fear can prevent people from entering a situation in which they feel threatened; [15] thus, they lose a possible learning experience [45]. Mezirow referred to similar emotions and claimed the first phase of a learning process is a *disorienting dilemma* [46].

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Teacher education programs should expose student teachers to the benefits of risk-taking and create learning opportunities that require them to experience and practice taking risks. Analyzing success and failure stories, as done in business schools, can provide additional exposure. Dealing with failure is hard. It requires reflection skills and a trusting environment but, if done properly, can support teachers' growth and perceptions of themselves as risk-takers.

Clearly, taking pedagogical risks within the protected environment of higher education or the practicum is beneficial, but stimulating risk-taking comes with its own risks and should be implemented with forethought and restraint. For example, it may encourage teachers who do not have the required knowledge to take risks just for the sake of trying or innovating [47].

2.2.7. Resources and technology

When the study participants talked about resources, they referred to (a) actual resources such as time, technology, and space and (b) their abilities to obtain and proactively use those resources—meaning, teachers who hack did not necessary have more assets but worked better with what they had. They maximized the use of existing resources or acted to access more for themselves and their students.

All participants mentioned time as an important and even crucial resource in their ability to hack their teaching. One stated, "I think it has a lot to do with whether or not you have the time to innovate and think about things and like trying new things." The resource of time was associated with other themes such as collaboration ("Being able to sit down and talk to your peers is so valuable"), and several teachers stressed that shared time, structured into the schedule, is necessary to collaborate with colleagues.

In addition to time, teachers who hack discussed technology and its connection with pedagogy, new skills, and communication and collaboration tools. Frequently (41%), participants raised issues related to technology juxtaposed with pedagogy. They shared examples of how technological tools supported their new pedagogies. For example, one participant gave her students a project that included making a book trailer and inserting QR codes (matrix barcodes) on their individual websites. Another teacher used an app called ChatterPix that can make a picture talk. She assigned the students a biography project in which they drew a picture of someone they had researched and then presented the talking picture in the classroom.

In my study, technology influenced participants' communication with students and parents and served as a personal development tool, a way to collaborate with colleagues, and a pedagogical tool in the classroom to support individualize learning. Teachers addressed technology in terms of the problems it helped solve or the goals it helped reach, as well as new challenges it embodied. Their ability to use technology also related to risk-taking. As one participant commented, "Innovating with technology is feeling comfortable with it."

The study findings regarding technology's central role in education reform corresponded with a plethora of recent reports, books, and articles [48–51]. Alan November, an international leader in education technology, made an important distinction between technology and innovation [51]. He illuminated that not every technology-based learning or teaching is innovative and stated that educators' focus should move beyond the device and toward the

design of learning. For example, adding a digital device to the classroom without a fundamental change in the culture of teaching and learning would not lead to significant improvement in student learning. Unless clear goals across the curriculum—such as the use of math to solve real problems—are articulated at the outset, one-to-one computing becomes "spray and pray" ([52], p. 1).

Teacher education programs have two strategies to influence teachers' use of technology: They can teach about it or they can practice it. Similar to technology integration into schools, integration into teacher preparation must serve learning goals and not be conducted just for the sake of adding technology. Technology is not a tool; it is a platform for learning, sharing information, connecting, and communicating. Teacher education programs should aspire to integrate technology and digital citizenship practices into *everything*. University professors should serve as role models for good technology integration in everyday learning and teaching, allowing students in education schools to experience for themselves the advantages (and challenges) of technology integration and then practice it better as teachers.

Another good platform is the practicum phase. The university can encourage on-the-job learning for student teachers coupled in a mentoring relationship in schools. Universities can also choose to work with and in K–12 schools that face challenges and practice technology integration at a high level.

Teacher education programs should encourage students to reflect about their digital experiences in addition to their experiences as learners. This conversation can help future teachers take risks, try new methods, and develop their professional identities as teachers in the twenty-first century.

2.2.8. Collaboration and learning communities

> *I don't think some people realize the importance.…You don't have to be in a bubble, like on an island by yourself.*

Changes in the ways teachers act occur not only in the classroom. Participants in my study described relationships with others as generally positive ways to share ideas, accept failures, promote shared goals, solve problems, and brainstorm solutions. One aspect of working with colleagues regarded mentoring relationships. A young teacher described, "You start to realize again, okay I'm learning and eventually I will be where this person is after 35 years. So it puts you at ease a little bit, too." This sentiment holds true not only for novice teachers. One participant stressed the importance of investing the time to create professional networks. Another described how communicating with others who do not necessarily think the way she thinks helped her clarify her own thinking and better articulate her pedagogic principles. A veteran teacher kept in touch with friends who worked with her at her last school to "bounce ideas off all the time."

Teachers who hack tended to subscribe to blogs and were active members of Facebook groups, allowing them to both inspire and be inspired by educators from all over the world. They

understood the value of breaking the loneliness of teaching and devoted time and efforts to being part of a community.

The literature supported the benefits of collaborative practice as well. "The work of educators in schools is greater than the sum of the individual parts" ([27], p. 13). When writing about breaking the leadership roles, power stated that schools must see themselves as a part of "communities of practice," [3, 18, 53] groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly [50]. Future teachers should have the habits and skills to collaborate as an integrative part of their actions.

A model in Australia included learning circles, or "learning communities of preservice teachers who are placed together in the same on-campus workshop and in the same school for their professional experience placement, and who meet regularly throughout the professional experience for professional dialogue."([32], p. 197) This practicum model positioned student teachers as responsible for their own professional learning and for contributing to a professional learning community, which differed from the passive role usually adopted in a traditional practicum. Le Cornu explained:

> *Each participant is not only to share their experiences and learning, but also to listen actively to their peers and ask enabling questions that will assist their peers to explore on a deeper level their own understandings of what they are learning ([32], p. 198).*

The responsibility for taking an active role and guiding their own learning can help future teachers navigate an educational environment that is (or should be) continually changing.

Juxtaposed with the importance of collaboration, participants in my study depicted collaboration with colleagues as problematic. They addressed the complexity of maintaining collaborative relationships in their day-to-day school lives due to issues of time, technology, motivation, coordination, and space. Teachers who hack often described themselves in the school setting using metaphors such as "lone wolf" or "an island." They discussed some loneliness as built into the teaching profession and some as part of the role teachers take upon themselves. Correspondingly, the literature acknowledged that many teachers feel the school and district organizational structures often discourage teamwork and that most teaching work is done alone [27].

Helping prospect teachers reflect on the difficulties and develop strategies to improve their ability to collaborate also has a place in teacher education. Thus, teacher education programs should encourage community-of-learner practices during teacher preparation. That way, students develop the habit of collaboration and understand the benefits of being part of a professional community.

3. Conclusion

Teachers who hack and can disrupt the public education from within are idealistic and adaptive and use resources effectively. The term *hacking* to describe the innovative actions of public

school teachers is a not perfect description. Even so, it offers an addition to the existing terminology of teachers as leaders or change agents by acknowledging the risk-taking, creativity, and open mindedness needed to lead change. The change in term from *innovators*, *leaders*, or *change agents* to *hackers* is not merely semantic. It reflects the change in skills teachers need today—skills that must be recognized, practiced, and improved. As such, teacher education programs should:

a. **Provide** students opportunities to be learners in nontraditional environments using progressive practices that serve as models for and enhance the use of twenty-first century skills.

b. **Expose** students to different school systems worldwide.

c. **Encourage** students to think critically about the philosophical issues and social goals of education in a democratic society.

d. **Design** pedagogical experiences and spaces where students will be required to take risks, experiment, receive feedback, and develop.

e. **Emphasize** and practice skills for twenty-first century teaching, such as reflection, problem solving, technology integration, collaboration, and life-long learning.

f. **Embolden** students to develop their personal identities and goals as educators.

This chapter offers a fresh lens through which to view and restructure teacher education and school organization to support the desired revolution in public education. As one participant phrased, "When you're hacking, you're doing something that is not quite traditional, exactly, and that confronts tradition. It could be playful." I could not agree more.

Thanks

Thanks to all the teachers who opened their classrooms and their minds and shared their experiences and perspectives.

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Chapter 8

Teachers' Knowledge of Curriculum Integration: A Current Challenge for Finnish Subject Teachers

Mikko A. Niemelä and Kirsi Tirri

Additional information is available at the end of the chapter

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Abstract

The purpose of this chapter is to explore and analyze the kind of knowledge curriculum integration (CI) required of teachers and how teacher education should be developed to prepare teachers better for CI. The chapter is organized as follows: first, the concept of CI is briefly introduced in the context of the Finnish curriculum for comprehensive schools. Then Lee Shulman's theory of teachers' knowledge is discussed and applied to the framework of CI to identify the challenges teachers may face in implementing it. Finally, implications for teacher education are suggested based on the current challenges identified in the Finnish context.

Keywords: curriculum integration, pedagogical content knowledge, Finnish national core curriculum for basic education, teacher education, subject teaching, secondary school

1. Introduction

Currently, active discussion of curriculum integration (CI) is taking place in Finland, because a new core curriculum for comprehensive schools has been implemented since 2016 [1]. For the first time, the new core curriculum presents CI normatively as a compulsory element of schoolwork. Earlier curricula have presented CI as a general objective to be considered by teachers in planning their teaching. At present, every comprehensive school in Finland is planning and implementing its own integrated learning modules.

The change is demanding, especially for secondary school teachers, who are specialized in teaching one or a few subjects, yet now are expected to create integrated learning opportunities

by connecting a number of subjects. This chapter acknowledges the current challenge for Finnish teachers and provides some suggestions for schoolwork and teacher education for how teachers can better meet the demands of CI. The aim is to provide concrete answers to the following research questions: (1) what kind of knowledge does CI require of teachers, and (2) how should teacher education be developed to give teachers better readiness for CI?

This chapter offers a theoretical contribution to pinpointing the challenges of implementing CI in schoolwork from the subject teachers' perspective. Lee Shulman's theory of teacher's knowledge [2, 3] is used to identify the challenges of CI for teachers in the context of the new Finnish core curriculum. Shulman's theory is useful here, because it describes categories of teachers' knowledge required for successful teaching. In this chapter, the most relevant Shulman's categories are briefly described, followed by a discussion of how these categories change in integrated contexts. Finally, some concrete suggestions are provided to include CI in teacher education programs.

2. Curriculum integration and the Finnish national core curriculum for basic education

CI played a strong role in the first Finnish core curriculum, written for comprehensive schools in 1970. The curriculum even included a plan of comprehensive school based completely on an integrated curriculum [4]. This plan was not realized, and CI was of less importance in the curricula that followed, which were published about once a decade, although the debate on CI was significant during the reforms [5]. The new *National Core Curriculum for Basic Education* is again strengthening the role of CI. Today, the implementation of CI is explicitly compulsory for all Finnish schools. Every school year has to include at least one multidisciplinary learning module lasting approximately 1 week. Additionally, the curriculum includes a list of seven cross-curricular transversal competences, such as multi-literacy and ICT competence, which are to be taught in connection with every subject [1].

Even though CI has been a feature of the Finnish comprehensive schools for almost half a century and is recognized as valuable by teachers, research shows that its implementation has not met the curriculum objectives [6, 7]. These results call for new studies of CI to develop teachers' work to meet the current demands. However, it has to be pointed out that this is not only a pedagogical issue, but also a social one. Lopes and Macedo [8] describe a subject-based curriculum as a form of control that sustains prevailing labor relations, knowledge processes, and the creation of identities and therefore resists change. Subject teachers form interest groups promoting particular subjects [9]. CI, however, does not have this kind of interest group behind it. Additionally, challenges connected to curriculum reform in general have an effect on implementation of CI, such as teachers' extensive workload, lack of curriculum knowledge, experience of top-down leadership of the reform, and insufficient resources for planning [10].

School curricula are usually organized around school subjects with notable similarities from country to country. This is sometimes taken for granted, yet the organization is a result of

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a long social process involving struggles with curriculum content [9]. CI can be seen as an alternative way of organizing schoolwork. Sometimes a school subject has a scientific discipline as a background, such as biology, although the science of biology is divided into many subcategories. A school subject can also be a cluster of many fields of knowledge. An example is environmental studies, which in Finnish primary school is a combination of biology, geography, physics, chemistry, and health education.

For example, in the Finnish system, students in grades one to six are given environmental lessons; by grades seven to nine—lower secondary school—environmental studies change to more specific science subjects. The older the students become, the more subject-based the schooling becomes [1]. This is significant both from the students' and from the teachers' points of view. In Finnish primary schools, teachers are usually giving instruction in the majority of the subjects, but in secondary schools, only one or a few subjects. In this chapter, the main emphasis is on secondary level education and the challenges CI presents for subject teachers at this level.

CI is generally seen as a process of teaching and learning that crosses the unnecessarily strict boundaries of school subjects, making connections among them. Integration can cover both content and/or process of learning [11, 12]. Content is integrated when contents of different subjects are in some way connected. How deeply the subjects are integrated can be described as a continuum, starting with studying subjects in parallel in order to view a theme simultaneously from multiple perspectives; the integration can also go as far as the complete abandonment of school subjects [13, 14]. In turn, process integration occurs, for instance, when the cognitive side of learning is entwined with the experiential. The Finnish *National Core Curriculum for Basic Education* describes the purpose and process of CI in the following way:

> *The purpose of integrative instruction is to enable the pupils to see the relationships and interdependencies between the phenomena to be studied. It helps the pupils to link knowledge of and skills in various fields, and in interaction with others, to structure them as meaningful entities. Examination of wholes and exploratory work periods that link different fields of knowledge guide the pupils to apply their knowledge and produce experiences of participation in the communal building of knowledge. This allows the pupils to perceive the significance of the topics they learn at school for their own life and community, and for the society and humankind. In the learning process, pupils are supported to structure and expand their worldview ([1], p. 32).*

The core curriculum mixes CI to some extent with inquiry learning. However, each can be realized independently. Furthermore, it presents CI as a way to enhance the social function of education. The issues of the community, the society or the humankind are usually so-called wicked problems, such as city planning, poverty or climate change. The concept of wicked problems refers to complicated issues that are hard to define, do not have a single solution, and are usually studied in various scientific fields. Planning of a school curriculum is in itself one example of a wicked problem [15]. The answers to fundamental questions of our age or of individuals seeking guidance in living must be sought in multiple sources. In schools, this can be called a didactic process, if mere adoption of knowledge is coupled with the aims of *Bildung*, i.e., creating personal significance and continuously developing a worldview [16].

Put concretely, the core curriculum mentions four ways of organizing cross-curriculum learning or even abandoning subject borders [1]. First, integration can be achieved through activities such as theme days, events, campaigns, study visits, or school camps. Second, longer integrated study modules can be created around a theme by combining the perspectives of various subjects. Third, integrated cluster subjects can be formed, for example, a science cluster that includes mathematics, physics, and chemistry. The fourth and most radical way is to organize all schoolwork holistically without any designated subjects. This is a common practice at the pre-school level in Finland.

However, to consider CI as the opposite of subject-based education would be incorrect. Integration can be seen as a normal feature in the pursuit of knowledge whenever teachers are constructing cross-disciplinary concepts in a subject-based curriculum [17]. The core curriculum offers two concrete examples of integration structured on differentiated subjects [1]. First, studies can be taught in parallel in such a way that one theme is studied simultaneously in different subjects, for example, climate change along with social studies, chemistry, and geography. Second, themes can be sequenced inside a single subject or between subjects so that a topic is learned along a continuum; an example would be studying Middle Eastern religions first in religious studies followed by the rise of the Islamic Empires and the Crusades in history.

3. Teachers' integrative knowledge

Lee Shulman has described the development of teacher education as a process in which pedagogical knowledge has become more and more openly acknowledged as essential competence along with subject matter content knowledge. However, according to Shulman, not enough attention has been given to the pedagogical skills necessary for teaching certain subject contents. Shulman's point is that pedagogical knowledge has been seen as too general, applicable to teaching any subject and all content. Instead, Shulman stresses the importance of pedagogical knowledge with which teachers can teach specific content in different subjects. The content of every subject needs its own pedagogical approach, i.e., *pedagogical content knowledge* to make it comprehensible to students. This is what Shulman has called *the missing paradigm* [2], although it has been argued that the paradigm has not been entirely missing, because it has long been a central feature of the German tradition of subject didactics (*Fachdidaktik*) [18].

Shulman presented his argument three decades ago, and the tradition of didactics has a much longer history. In Shulman's theory and in the tradition of subject didactics, the pedagogical questions of school subjects have been widely discussed, but pedagogies of CI have been taken up to a much lesser degree. Additionally, the recent discussion on development of teacher's competences has been bind to subject teaching [19]. This can be called *the missing paradigm of today*. There are many manuals of CI and reports of experiments on CI, but the question of what kind of pedagogical knowledge CI requires from teachers is rarely answered. Generally, researchers have been more interested in well-working performance than in the knowledge base and reasoning of teachers [20].

As Kansanen [18] states, Shulman's model fits research purposes well, and the tradition of didactics acts more as a normative basis for teachers in their work. Although Shulman has been criticized for a static understanding of the meaning of subject matter [16], there are many reasons why in this chapter Shulman's theory is applied to the study of the challenges of CI. First, Shulman's theory of teachers' knowledge serves as a clear model for analyzing the requirements of teachers' work. Second, Shulman is open to the idea of CI, although he does not examine it from the viewpoint of teachers' knowledge. In any case, Shulman sees CI as one possible way of constructing a curriculum. However, he claims that if CI is taken seriously, it will have profound consequences when the discussion of how a scientific discipline becomes a school subject changes to something else [21], because if a curriculum is integrated, then there are no longer subjects with parallel disciplines. Finally, his examples come mostly from secondary schools. This suits the level of interest in this chapter.

The strategy in this chapter is to examine the effects of CI on different categories of teachers' knowledge. We discuss four Shulman's categories that are most relevant from the viewpoint of CI: (1) content knowledge, (2) curriculum knowledge, (3) pedagogical content knowledge, and (4) knowledge of educational ends, purposes, and values. Shulman presented interdisciplinarity as a part of content and curriculum knowledge [22]. He has not explained all these knowledge categories at length and has used them in an inconsistent way in different texts [23]. For those reasons, some of categories are seen to be partly overlapping [24].

In this section, another category is added as the aforementioned knowledge categories are interpreted and discussed from the perspective of CI. This category can be called *integrative pedagogical knowledge*, which crosses all categories. It is not an independent knowledge category, but an approach to each category from the perspective of CI. It is an addition to Shulman's subject-centered theory. The following sections describe what kinds of integrative pedagogical knowledge teachers need in order to implement CI. In short, teachers need understanding of CI as one option for constructing a curriculum, and they need broad knowledge of the current curriculum, including the content and objectives of subjects they are not teaching themselves. For CI to be successful, its purpose has to be clearly comprehended. Furthermore, in collaborative forms of CI, teachers need good skills and conditions for cooperation across subject borders.

3.1. Content knowledge

Content knowledge refers to teachers' awareness of the facts and the structure of their subject(s). In addition, a teacher must know why these are the accepted facts in a given field, how knowledge is constructed, why some aspects of the field are more important than others, what alternative understandings of a subject exist, how the facts are related to other concepts within and outside of the discipline, and why these things are worth knowing in the first place [2, 3]. Shulman does not problematize the relation between scientific disciplines and school subjects. In this way, the fundamental question of content knowledge is left open. According to Stengel [25], Shulman assumes that disciplines precede school subjects and that the task of teachers is to modify disciplinary content knowledge into learnable form, i.e., transform it into a school subject.

Thus, Shulman's assumption about the relation of disciplines and school subjects seems to be inadequate. Direct transformation of a scientific discipline into a school subject is hardly a reality, even with subject teachers who have received a disciplinary education. It would be practically impossible for a teacher to know a discipline so thoroughly and coherently that s/he could simply transform it into a school subject [25]. For example, a subject teacher who graduated as a history major might have strong content knowledge of the Cold War period, but only fragmented knowledge of antiquity. However, history as a school subject should cover all relevant historical periods, not just those in which a teacher has specialized. Thus, the content to be studied is more than or different from teacher's disciplinary knowledge.

Shulman [3] is aware of how teachers' content knowledge is not equally distributed to cover all aspects of a subject. He shows an empirical example of how teaching becomes different when instruction based on good content knowledge changes to subject content with which a teacher is not well acquainted. Rich, versatile teaching then turns into rigidly planned, inflexible pedagogy. Thus, the better content knowledge a teacher has, the better chances there are to develop a good level of pedagogical content knowledge. This is why it is worth spending a bit more time to consider what content knowledge really is.

The most common assumption about the origin of knowledge for teaching is the one Shulman presents, namely, that scientific disciplines are transformed into school subjects [25]. This is the case in teacher education programs, such as in Finnish subject teacher education, in which student teachers study scientific disciplines at the university level and are educated as specialists in certain disciplines and then equipped with pedagogical knowledge. However, Lopes and Macedo [8] claim that there is not necessarily a relationship between scientific disciplines and school subjects. They represent school subjects as autonomous communities that are socio-politically constructed and constantly mutating. The social objectives of school subjects are viewed differently than the objectives of science.

If the content of content knowledge does not come directly from scientific disciplines, then content knowledge should be considered as leaning on other sources, such as a curriculum, textbooks, teachers' guides, and media. It is beyond dispute that scientific disciplines and school subjects are somewhat symmetrical and that part of teachers' content knowledge comes from specific disciplines, especially the deeper knowledge of alternative views and competing theories within a discipline. However, to answer the question of why some things are worth knowing, for instance, one might look for very different explanations in school contexts as opposed to the contexts of scientific inquiry.

According to Deng [26], an integrated curriculum distances school subjects from scientific disciplines. If subjects are integrated into broader clusters, the new integrated subjects might create their own fields of knowledge without a corresponding scientific discipline. Deng uses science and technology studies as an example of a commonly integrated subject. However, Deng does not point out that disciplines can also be integrated into a form of interdisciplinary science. It is not rare to find interdisciplinary science programs combining natural sciences and technology. Thus, CI might find correspondence in interdisciplinary science projects. Another question is how these kinds of studies affect teacher education and the development of teachers' content knowledge. We will return to this question in the last section.

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Although Shulman sees teachers' ability to relate the content knowledge of a subject(s) to other subjects as a part of content knowledge, it is hard to guarantee that teachers have the necessary capabilities to do that. As mentioned above, in teacher education programs subject teachers are specialists in one or a few disciplines, and student teachers do not necessarily have any contact with subjects other than their own except for what they learned in their own school days. As Gardner and Boix-Mansilla state [27], if one does not have enough content knowledge of the subjects to be integrated, CI can be degraded to a pre-disciplinary level, the work based on common sense instead of expertise. Kysilka [13] has indicated that the lack of disciplinary knowledge is a problem for subject teachers as well as for primary school teachers, whose knowledge of the subjects might be too shallow to enable real integration. If the ability to relate is taken seriously as part of teachers' content knowledge, then some interdisciplinary studies will be required in teacher education, a topic discussed in the last section.

3.2. Curriculum knowledge

By curriculum knowledge, Shulman means teachers' broad comprehension of school subjects and an understanding that the current one presents only one way of constructing a curriculum. Curriculum knowledge includes awareness of various instructional materials, teaching procedures, and learning objectives. Teachers commonly use different kinds of curricular materials from which to pick suitable tools. It is important that teachers realize that they could pick other tools as well, that alternative learning methods are available, and that there are different ways to structure a course or a curriculum, for example, in an integrative way. This *knowledge of alternative curriculum materials* is the first of three different forms of curriculum knowledge Shulman explains. The other two are *lateral* and *vertical curriculum knowledge*.

By *lateral curriculum knowledge,* Shulman refers to teachers' ability to know what the students are learning in various subjects simultaneously. Here Shulman makes a general assumption by stating that he expects professional teachers to be aware of what students are doing outside of a teacher's own classes [2]. He also points out that for comprehension of their own subject matter, teachers would need to know how the concepts are related to other school subjects as well [3]. These are admirable objectives, but it can be asked how far this ideal is from the current reality of schools and teacher education. If the content of subjects that are not one's own is alien to teachers, then it can be posited that there are no means of knowing what is being learned in other subjects, especially simultaneously. In addition, Rogers [28] stresses teachers' profound identification with their own subject subcultures, including their particular beliefs, norms, and practices. These aspects are usually in the form of tacit knowledge, which guides everyday work, yet is not simple to express. Without knowledge of these subcultures, cross-curricular coordination can be restricted.

Lateral curriculum knowledge makes high demands of subject teachers and requires sharing information within schools. Yet, such knowledge is one prerequisite for CI in its many forms. *Vertical curriculum knowledge* in turn refers to teachers' knowledge of what has been previously taught in one's subject(s) and what will be taught in the future [2]. Such knowledge is a starting point for integration within a single subject with the goal of making the content of one subject more interconnected and experienced as a whole in students' consciousness. With history

once again as a simplified example, vertical curricular knowledge includes comprehension of how certain historical phenomena intertwine and ultimately create a new phase in history, such as industrialization together with globalization, which serves as a pathway to modernity. If lateral and vertical curriculum knowledge are applied together to integrate the curriculum, the process can advance step by step, beginning with studies of force in physics, metalwork in crafts, continuing with historical and economic significance of the steam engine followed by geographical understanding of urbanization and the development of logistics leading to globalization, then drawing the conclusion historically—the birth of the modern world.

3.3. Pedagogical content knowledge

The third kind of pedagogical knowledge essential for CI is teachers' ability to make content comprehensible to students. However, mere comprehension is not enough; according to Shulman, true learning is also linked to judgment and action [3]. This is what is called *pedagogical content knowledge*. It includes examples, metaphors, analogies, illustrations, activities, assignments, and demonstrations that make the content more accessible. This kind of knowledge also means understanding what makes learning of certain kinds of content difficult and what the common misconceptions are. Such pedagogical methods are always content-specific so they cannot necessarily be transferred to other contexts [2].

Shulman argues that pedagogical content knowledge is the area that separates a teacher from an expert in a given scientific discipline [3]. An expert might have a great deal of content knowledge, but a teacher knows how to present the information in a suitable way for school learning. However, as noted above, the substance of the content knowledge of an expert and that of a teacher are probably different, because scientific disciplines and school subjects are not constructed identically.

The relation between content knowledge and pedagogical content knowledge is not one-way. In addition to content knowledge that is refined into pedagogical content knowledge, the content of school subjects can be constructed on pedagogical bases. Content may be designed for certain age groups, as happens in the Finnish school system: the integrated subject taught as environmental studies in primary school is differentiated into natural sciences in secondary school. This is an example of how CI serves as a form of pedagogical content knowledge. A school subject is designed as an integrated whole with the aim of making the content more comprehensible to young students.

Often CI means studying contents of several subjects in connection. This means that the understanding of pedagogical content knowledge cannot be bound only to subjects, but also involves building bridges between subjects. At that point, it becomes *integrative pedagogical content knowledge*. A teacher has to have in mind demonstrations or activities that show how different subjects are interrelated or even build on knowledge from other disciplines, as in the above-mentioned example of the birth of modernity. Another possibility is to use the methods of co-teaching, collaborating with other teachers, who combine the special pedagogical content knowledge of their respective subjects. Then communication and shared understanding between teachers becomes crucial. However, the challenge for integrative co-teaching is that, in Finnish schools, it has been seen mostly as an instrument for inclusive education rather than being considered primarily in the context of CI. Research shows that co-teaching is rarely

implemented as a collaboration between subject teachers, but is more often concentrated on using special education teachers as partners [29].

When CI is implemented with the methods of inquiry learning, the learning process and the content might not be securely in the hands of a teacher, if the students decide a theme. Then the content is not known beforehand, and building of pedagogical content knowledge can be seen as a challenging task because the content part is missing. Shulman claims that in student-centered learning, the importance of the teacher's grasp of the study content becomes even greater than in teacher-centered approaches. Shulman notes that the student-centered approaches require a strong capacity for sympathetic interpretation and transformation of content into representations [3]. In student-centered approaches, a teacher needs a deep understanding of what is being learned to enable the learning process to progress in an indeterminate direction. That being said, we can conclude that if CI is implemented in a way that a theme is selected about which teachers do not have enough content knowledge, there is no chance of developing adequate pedagogical content knowledge, and therefore, the process is likely to fail. Accordingly, if the process of CI is to be actualized successfully, then even more focus has to be put on development of teachers' content knowledge.

3.4. Knowledge of ends, purposes, and values of education

Shulman claims that normative and theoretical knowledge of ends, purposes, and values of education is perhaps the most important part of teachers' scholarly knowledge. This includes images of what is possible, of how a well-functioning school might look, what the students should become, and what can be understood as comprising a good education [3]. The Finnish core curriculum stresses the holistic growth of students as ethical persons. For teachers to cultivate moral and social awareness in students, the prerequisite is that teachers have a good understanding of educational values and purposes. In addition to general educational values, subject-specific values can be recognized [30]. Accordingly, CI can be seen as having its own, although varying value base.

The need for an integrated curriculum frequently emerges from ethical or social issues. It can even be directly aimed toward solving problems of the society or the local community. For example, CI is now popular in Finnish schools as a means of teaching what climate change means and what can be done to stall, if not reverse it. In addition, CI can serve as a form of democratic education [31, 32]. Altogether, it can be said that the strength of CI is that it can have a strong purpose, a pedagogical mission. Therefore, CI can be seen as an idealistic form for a curriculum [10]. However, for CI to be successful, the purpose has to be fully comprehended by teachers, a situation that might not always be the case in Finland, where CI has not had a stable role in teacher education [33].

4. Finnish subject teacher education and curriculum integration

Teacher education has a decisive role to play in developing teachers' *integrative pedagogical knowledge*. In this last section, the challenges identified by applying Shulman's categories of teachers' knowledge are discussed in the framework of subject teacher education with

the objective of generating suggestions for how teacher education in universities could be developed to equip teachers with information, the abilities, and the will to implement CI as described in the new Finnish core curriculum.

The analysis of Shulman's categories revealed aspects to be considered when subject teacher education is developed from the perspective of CI. Primarily, student teachers have to be aware of CI as one alternative for structuring the curriculum. This means knowledge of general curriculum theory, including CI. It is important for student teachers to know that a curriculum is historically constructed and that subject division is only one form of its actualization. This information is crucial when teachers are constructing local curricula based on the core curriculum.

Another required form of curriculum knowledge concerns the content of the current curriculum. To apply CI successfully, student teachers need to have at least preliminary knowledge of contents of subjects they are not teaching themselves. Without this kind of knowledge, it is difficult to plan teaching that connects various subjects. It is a prerequisite for individual teachers to be able to build conceptual bridges between their subjects and other subjects. In addition, broad curriculum knowledge promotes collaboration when teachers can identify the intersections of subjects. These intersections can serve as a basis for integrative themes.

According to Shulman, a sound level of content knowledge is required for developing pedagogical content knowledge. However, subject teachers cannot be an expert in all subjects. It is a challenge for every teacher to master even a preliminary understanding of all subjects. One approach is to design instructional materials that would assist in building conceptual bridges between subjects. Furthermore, building a better content knowledge base for CI could be an objective for teacher education, although it has been suggested that student teachers should first develop subject-based knowledge before getting into CI [33, 34].

Because in Finland prospective subject teachers study their subjects outside departments of teacher education, the question of content knowledge concerns university studies in general. Since Shulman sees content and pedagogical knowledge as intertwined, he states that teacher education is the responsibility of the entire university [3]. Combining interdisciplinary courses and teacher education programs can improve students' understanding of the links between disciplines. In this way, CI is woven into the development of interdisciplinary studies in universities. Universities with teacher education programs can take into account the need to develop teachers' integrative knowledge by designing interdisciplinary study modules, although the difficulties and feasibility of using (inter)disciplinary knowledge directly for teaching purposes have been discussed above [25, 26].

A subject-based curriculum is the usual way of arranging schoolwork in Finland. When a change is proposed to the status quo, it must be well reasoned in order to make the objectives visible and understandable. Teacher education in Finland emphasizes pedagogical thinking [35], which requires teachers to understand the objectives of the curriculum. Shulman saw knowledge of educational purposes as being one of the most important categories of teachers' knowledge. As seen in the quotation above, the Finnish core curriculum briefly describes

the purpose of CI. Today, when CI is expected of schools, its purpose needs to be clearly acknowledged by teachers in order to enhance motivation to carry out the necessary reforms and plan integrated teaching in a goal-directed way. In teacher education, the purpose of CI has to be made explicit to inspire student teachers to develop their professional knowledge to include CI.

In subject teacher education programs in Finland, student teachers in different subjects study with instructors who are specialized in pedagogical content knowledge/didactics of certain subjects. Yet, in schools, teachers of all subjects form a community. It would be valuable for student teachers to gain experience in collaborating with student teachers in other subjects during the course of their university education. In some forms of CI, cross-subject collaboration is inevitable, and the experience with other teachers' subjects makes co-teaching and collaborative planning in CI more manageable. CI emphasizes the communal aspect of schoolwork. Bresler ([11], p. 36) describes it with a musical metaphor as "a shift from solo performance to a chamber work." Thus, co-teaching and collaborative planning have to be perceived from the perspective of CI. The outcome of experience in collaboration might not only be a better understanding of other subjects and their cultures, but also a better understanding of one's own disciplines and subjects and their presuppositions and commitments [36].

It is known that novice teachers in Finland are more interested in CI than are experienced teachers, but lack the courage and skills to implement it [33]. A teacher education program can be designed so that every student teacher has to take part in planning and implementing at least one integrated study module with other student teachers. Once the process is completed from beginning to end, the whole idea of CI is likely to be better comprehended. Because student teachers do not necessarily have any prior experience of CI, it would be difficult to expect them to apply it successfully in practice if it was not part of a teacher education program [37].

Perhaps the strongest challenge in developing teacher education from the perspective of CI is the strong tradition of subject-divided pedagogies and teachers' fixed positions as subject teachers. Another challenge from a teacher's perspective is created when all the "innovations," such as use of the latest technology, enhancing co-teaching and CI, are implemented at the same time [38]. In some visions the future teaching staff will consist of generalist and specialist teachers working together in new cooperation-based schools [33]. A good starting point is not only developing subject pedagogy, but also developing a pedagogy for CI. There is a long tradition of general and subject didactics in Finland, but there is no such a thing as a didactics of CI, although some experiments have been carried out in departments of teacher education [33, 39]. Here we can see the missing paradigm of today: the development of *integrative pedagogical knowledge* that would include at a minimum (1) knowledge of CI as a possibility for constructing a curriculum, (2) knowledge of concepts bridging different subjects, (3) knowledge of the purposes of CI, and (4) knowledge of collaborative teaching by subject teachers. Today, when the new Finnish core curriculum is requiring every school to implement CI, there is reason to research and teach it systematically in departments of teacher education.

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As with most dynamic activities that are based on social and cultural contexts and rely on interactions, education is a complex and often ambiguous endeavor. Despite this complexity, scholars and educators are often required to find ways of defining and explaining what "good" teaching is and to incorporate these conclusions into teacher education. This book contains eight scholarly articles from various countries around the world and offers unique and up-to-date perspectives on relevant practices and pedagogies for teachers' professional education and development. In this international book, it is argued that there is a significant inspiration and enrichment to be gained by investigating the policies and practices of teacher education systems from all over the world.

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