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Researching practice-based teacher education: Trends, challenges, and recommendations for future research

Abstract

Teacher educators and policymakers worldwide have called for a practice-based teacher education. However, the body of research on teacher education is limited, as is the knowledge about practice-based teacher education. This article summarises six recent comprehensive research reviews on teacher education. It gives an overview of the research trends in international research on practice-based teacher education with regard to research focus, research designs, and validity issues. The article discusses challenges within this field of research and provides recommendations for future research. It concludes that further research—using a greater variety of research designs and paying closer attention to methodological developments—is needed.

Keywords: practice, teacher education, review

Å forske på praksisbasert lærerutdanning: Trender, utfordringer og forslag til fremtidig forskning

Sammendrag

Lærerutdannere og politikere verden over argumenterer for en praksisbasert lærerutdanning. Likevel er det lite forskning på lærerutdanning generelt, og i enda større grad; forskning spesifikt på en praksisbasert lærerutdanning. Denne artikkelen oppsummerer seks nye, omfattende forskningsreviewer på lærerutdanning, ved å identifisere trender i forskningen på praksisbasert lærerutdanning. Artikkelen fremhever forskningsfokus og forskningsdesign som identifiseres innenfor denne litteraturen, samt problemer ved denne forskningens validitet. Basert på dette diskuterer artikkelen utfordringer innenfor forskningsfeltet, og gir anbefalinger for videre forskning. Artikkelen konkluderer med at det er et behov for videre forskning innenfor dette feltet, som tar i bruk større forskningsmetodisk variasjon, og som i større grad bidrar til forskningsmetodisk utvikling.

Nøkkelord: praksis, lærerutdanning, review

Policymakers and researchers worldwide have long emphasised the need for practice-based teacher education (British Educational Research Association, 2014; Conway & Munthe, 2015; Darling-Hammond, 2017; Donaldson, 2011; National Council for Accreditation of Teacher Education [NCATE], 2010). A cross-case analysis of different countries including Australia, Chile, China, India, South Africa, Uganda, and the United Kingdom revealed that the placement of teacher education within the university has increased the status of teacher education but has simultaneously led to a greater separation from practice (Moon, 2016). Looking at these cases, Moon (2016) concluded that university-based teacher education must embrace teaching practice to enhance its role in teacher preparation. Similarly, in the United States, a panel of experts argued that teacher education needed to be “turned upside down” so that practice would become the basis for the work of learning to teach (NCATE, 2010, p. ii). Practice in teacher education is highlighted in high-performing states as determined by student outcomes on tests such as PISA and TIMSS. A study of teaching policy across three continents and five countries revealed increased attention to clinical experiences during teacher preparation with regard to duration, and ways of connecting these experiences to coursework and programme goals (Darling-Hammond et al., 2017).

Practice-based teacher education is not a new concept; it can be traced back to normal schools in the United States in the early 19th century (Forzani, 2014). More recently, researchers like Zeichner (2012) in the United States and Reid (2011) in Australia have discussed a return to practice. Still, the concept of practice-based teacher education is unclear (Forzani, 2014). Many have argued that instituting practice-based teacher education might simply involve increasing the amount of fieldwork for candidates, such as in residency programmes or other kinds of apprenticeship models (Forzani, 2014; Zeichner, 2012, 2016). Others have highlighted the importance of creating connections between fieldwork and coursework or theory and practice by, for instance, approximating practice and making the coursework more connected to practice (Ball & Forzani, 2009; Forzani, 2014; Grossman, Compton, et al., 2009; Grossman, Hammerness, & McDonald, 2009).

Nevertheless, researchers have argued that research on teacher education is in its infancy (Borko, Liston, & Whitcomb, 2007; Cochran-Smith et al., 2016; Zeichner, 2005). As such, little knowledge exists about practice-based teacher education, which is the focus of this article. Given the recent attention paid to practice-based teacher education, this article aims to address this gap in knowledge by summarising previous research reviews on teacher education, emphasising the concept of practice-based teacher education. This study aims to answer the following research question: What are the research trends in research on practice-based teacher education in terms of (a) research focus, (b) research designs, and (c) validity issues? The article ends by discussing the challenges

within this body of research in light of the recent shifts within this field, and points to a future research agenda for practice-based teacher education.

Methods

This article summarizes reviews from four of the main international handbooks of research on teacher education since 2005, and aims to “identify what has been accomplished previously, allowing for consolidation, for building on previous work, for summation, for avoiding duplication and for identifying omissions or gaps” (Grant & Booth, 2009, p. 97). As such, this literature review is not a systematic review (e.g., Gough, Oliver, & Thomas, 2012), and in order to avoid some of the weaknesses normally associated with literature reviews (cf. Grant & Booth, 2009), I will outline the selection criteria and the process of systematising the research included in this literature review in the following.

Selection criteria

The selected handbooks were chosen because they are commonly cited in the field. Across these handbooks, only research reviews that focused on practice-based teacher education were selected. Research on practice-based teacher education was conceptualized as research related to fieldwork and coursework (see, e.g., Forzani, 2014). More specifically, the selected reviews focused on (a) the organisation and amount of fieldwork and (b) the quality of fieldwork. Reviews investigating teacher education coursework in terms of (c) subject matter courses, (d) methods courses or subject didactical courses, (e) foundations or pedagogy, and (f) research methodology were also included. From the reviews focusing on teacher education coursework, only research that connected to practice in any way was selected—for instance, research on pedagogies of teacher education approximating practice (see Grossman, Compton, et al., 2009) or research on the effects of coursework relating to practice. This means that reviews focusing on teacher candidates’ development of professional identity or motivation, for example, were not selected for this literature review. The six selected reviews are outlined in Table 1.

Table 1. Research reviews selected for the literature review

Research review	Years	Coursework	Fieldwork
Clift, R. T., & Brady, P. (2005). Research on methods courses and field experiences. In M. Cochran-Smith & K. Zeichner (Eds.), <i>Studying teacher education: The report of the AERA panel on research and teacher education</i> (pp. 309–424). Mahwah, NJ: Erlbaum.	1995–2001	x ^a	x
Floden, R. E., & Meniketti, M. (2005). Research on the effects of coursework in the arts and sciences and in the foundations of education. In M. Cochran-Smith & K. Zeichner (Eds.), <i>Studying teacher education: The report of the AERA panel on research and teacher education</i> (pp. 261–308). Mahwah, NJ: Erlbaum.	1990–2005	x ^b	
Zeichner, K. M., & Conklin, H. (2008). Teacher education programs as sites for teacher preparation. In M. Cochran-Smith, S. Feiman-Nemser, D. McIntyre, & K. Demers (Eds.), <i>Handbook of research on teacher education: Enduring questions in changing contexts</i> (pp. 269–289). New York, NY: Routledge.	1985–2004	x ^c	x ^c
Berry, A., Depaepe, F., & Van Driel, J. H. (2016). Pedagogical content knowledge in teacher education. In J. Loughran & M. L. Hamilton (Eds.), <i>International handbook of teacher education</i> (Vol. 1, pp. 347–386). Singapore: Springer.	1985–2014	x	x
Cochran-Smith, M., Villegas, A. M., Abrams, L. W., Chávez-Moreno, L. C., Mills, T., & Stern, R. (2016). Research on teacher preparation: Charting the landscape of a sprawling field. In D. H. Gitomer & C. A. Bell (Eds.), <i>Handbook of research on teaching</i> (5th ed., pp. 439–547). Washington, DC: American Educational Research Association.	2000–2012	x	x
Orland-Barak, L. (2016). Mentoring. In J. Loughran & M. L. Hamilton (Eds.), <i>International handbook of teacher education</i> (Vol. 2, pp. 105–141). Singapore: Springer.	1990–2014		x

^aThe review focuses on methods courses. ^bThe review focuses on subject matter and foundations. ^cThe review focuses on programme design but touches on the design of both coursework and fieldwork.

The literature review covers handbooks published from 2005 to 2016, with the reviews in the handbooks covering research from 1985 to 2014.

Systematisation of research reviews

After the first step of selecting reviews based on their relevance to this article's conceptualisation of practice-based teacher education, all reviews selected for the literature review were categorised according to their (a) research focus, (b) research designs, and (c) validity issues. Research trends were identified across these aspects using thematic analysis through open coding (Saldaña, 2012).

Trends in research on practice-based teacher education

Knowledge and evidence about practice-based teacher education is sparse in Norway (Haugan, 2011; Author, 2017) and worldwide (Borko et al., 2007; Cochran-Smith et al., 2016; Zeichner, 2005). Nevertheless, some research trends are apparent in the body of research on practice-based teacher education. The following sections present these trends in terms of (a) research focus, (b) research designs, and (c) validity issues.

Research focus

The main trend in research related to the coursework of practice-based teacher education is that this research often focuses on the effects of the coursework and the effects of programme design. Concerning fieldwork, the research focus seems to be on examining different kinds of partnerships in mentoring, the structure of fieldwork, and the roles and effects of mentoring. The trends in research focus found in the individual reviews are outlined in Table 2.

Table 2. Research focus of the reviews

Research review	Research focus
Clift & Brady (2005)	Impact of methods courses on prospective teachers' thoughts about practice Partnerships and organisation of fieldwork No comparative questions
Floden & Meniketti (2005)	Effects of coursework on teacher effectiveness and pupil learning
Zeichner & Conklin (2008)	Effects of teacher education programme structure on student learning
Berry, Depaepe, & Van Driel (2016)	Relationship between teacher candidates' pedagogical content knowledge (PCK) and instructional behaviour Organisation and quality of fieldwork related to teacher candidates' PCK development
Cochran-Smith et al. (2016)	Pedagogies of teacher education coursework and their effect on teacher candidates' learning, mainly related to their beliefs and understandings Influence of interactions between triad participants on teacher candidates' opportunities to learn to teach Influence of alternative as opposed to traditional structures on student teaching Influence of teacher candidates' characteristics, school-related factors, and fieldwork features on learning outcomes
Orland-Barak (2016)	Outcomes of mentoring but few studies on the effect of mentoring on teaching behaviour and pupil learning

Concerning teacher education coursework, Clift and Brady (2005) reported that most of the studies in their review were about the impact of methods courses on prospective teachers' thoughts about practice. They found that a few studies examined teacher candidates' actual teaching practice, but the focus was mostly on measuring changes in teacher candidates' beliefs and attitudes.

Similarly, Floden and Meniketti (2005) found that most of the studies in their review investigated the effects of coursework on teacher effectiveness and pupil learning. These studies highlighted different aspects of coursework, such as subject matter knowledge, diversity, inquiry teaching, and discussions. The authors found few studies on the foundational courses.

With a special focus on teacher candidates' development of pedagogical content knowledge (PCK; see Shulman, 2015), Berry, Depaepe, and Van Driel (2016) referred to one study examining the relationship between teacher

candidates' PCK and instructional behaviour. The study found that the PCK level was a strong predictor of instructional quality.

Finally, Cochran-Smith et al. (2016) also found research focusing on the effects of teacher education coursework but emphasising pedagogies of teacher education and their effects on teacher candidates' learning and development as professional teachers. They revealed that most of the studies focused on teacher candidates' beliefs and understandings. Many of these studies examined whether and to what extent teacher preparation influenced teacher candidates' professional practice, which included reflecting on, inquiring about, and knowing how to learn about changing classroom situations. According to Cochran-Smith et al., only a few studies focused on actual teaching strategies, although some examined the teacher candidates' opportunities to learn about the complexity of teaching by analysing real or hypothetical situations (e.g., vignettes, cases, reflection, and action research).

Moving on to research on fieldwork in teacher education, Clift and Brady (2005) identified studies investigating the triad relationship between teacher candidate, university supervisor, and school mentor. They found no studies investigating comparative questions.

Berry et al. (2016) found that the concurrent organisation of fieldwork and coursework had a positive effect on the candidates' PCK development, and the quality rather than the quantity of fieldwork seemed to have a positive effect. Cochran-Smith et al. (2016) summarised this body of research along three lines of inquiry: (a) research on how interactions between triad participants influence teacher candidates' opportunities to learn to teach, (b) research on the influence of alternative as opposed to traditional structures on student teaching, and (c) research on how teacher candidates' characteristics, school-related factors, and fieldwork features influence learning outcomes. As in the body of research on practice-based teacher education coursework, Cochran-Smith et al. (2016) found that research on teacher education fieldwork has not focused much on the development of teaching practices. When practice was the focus of investigation, teacher candidates were typically involved in developing lesson plans for students in their field placement sites.

Orland-Barak (2016) found studies on the outcomes of mentees' learning, emphasising processes and conditions that enhance mentees' learning. She argued that this aspect of mentoring has been less investigated than other aspects such as the mentor role and mentor learning. She claimed that there are few studies on the effects of mentoring on teaching behaviour and pupil learning. She pointed to a disconnect between the processes and outcomes of mentoring within this body of research and reasoned that connecting these would be the main challenge in the future.

In summary, the key questions in this body of research centre on the effects of teacher education coursework, although some of the reviews emphasised that these are mainly connected to effects concerning the teacher candidates' beliefs

about practice or their conceptual understanding rather than their actual teaching strategies. Key questions concerning research on fieldwork centre on the organisational structures of fieldwork and the relationships within these structures, as well as on how these influence teacher candidates' learning and development. Many reviewers pointed to a lack of emphasis on teacher candidates' teaching strategies. This broad overview of the specific research interests within this field identifies a focus on sensible and important questions for the field of teacher education. The overall focus on examining the effects of key features of teacher preparation is necessary to advance the field. Of further interest is whether the research questions in focus can be answered by the research designs commonly used within this body of research.

Research designs

The present review revealed that most studies used qualitative research methods with small sample sizes and self-studies, albeit with some exceptions. The trends in research designs found in the individual reviews are outlined in Table 3.

Table 3. Research designs found in the reviews

Research review	Research designs
Clift & Brady (2005)	Qualitative case studies Classroom observations, interviews, analysis of lesson plans Self-studies Lack of comparative studies and longitudinal studies
Floden & Meniketti (2005)	Interpretive studies, as well as experiments and pretest–posttest studies
Zeichner & Conklin (2008)	Self-report data such as programme documents and reports from teacher educators
Berry, Depaepe, & Van Driel (2016)	Small-scale studies measuring pedagogical content knowledge (PCK) in a dynamic way Large-scale, experimental, longitudinal, and/or comparative studies measuring PCK in a static way
Cochran-Smith et al. (2016)	Small qualitative (self-) studies Lack of longitudinal studies and studies on the impacts of teacher education on teaching practice
Orland-Barak (2016)	Small-scale case studies

Clift and Brady (2005) found mainly qualitative case studies using data such as classroom observations, interviews, and course material (i.e., lesson plans). They also identified an increasing number of self-studies and warned against the possibility of self-fulfilling findings. They identified no comparative studies or longitudinal studies and argued that the lack of longer-term studies limits the understanding of the effects of coursework and fieldwork on teachers' learning

over time. They emphasised that although the research provided evidence of the effects of teacher education coursework, these effects were often in terms of conceptual change—and researchers assume a connection between conceptual change and behavioural change. They recommended (a) greater openness about the research designs and participants included in specific studies, (b) increased collaboration efforts to decrease the challenges involved in smaller self-studies, (c) more precise definitions of terms, (d) thicker descriptions of contexts, and (e) increased efforts to fund larger and longer studies (Clift & Brady, 2005, pp. 332–336).

In their review, Floden and Meniketti (2005) found that the research designs are mostly interpretive studies (e.g., candidate reflections) but also include experiments and pretest–posttest studies (see Table 3). They argued that the evidence base concerning the effects of teacher education coursework is scant; when effects are measured, detailed information about the kind of knowledge gained by the teacher candidates is often lacking. They concluded that there is a need for (a) improved measures of teachers' knowledge, skills, and dispositions; (b) the creation and use of national and international datasets; and (c) a sharpened vocabulary for describing college coursework (Floden & Meniketti, 2005, p. 284).

Zeichner and Conklin (2008) stated that most of the data on the effects of teacher education programmes were from programme documents and reports from teacher educators, providing surface descriptions of the programmes. They argued that more research should examine other data sources to provide an in-depth analysis of the character and quality of the programmes. Although such research designs are more complex and expensive, Zeichner and Conklin (2008) argued for a research programme rather than individual studies. They emphasised that rigorous research designs, methods, and instruments developed within a study can be used and built upon in later smaller studies, but they found this uncommon within the field.

Berry et al. (2016) found two different strands of research on teacher candidates' PCK development: The first conceptualises and measures PCK in a dynamic way (i.e., understands PCK as more complex) and often uses small-scale research designs. The second conceptualises and measures PCK in a more static way (i.e., understands PCK as independent of the person or context and as measurable using a specific instrument) and often uses large-scale, experimental, longitudinal, and/or comparative study designs. Berry et al. concluded that there was a lack of systematic studies using high-quality measures of PCK, a lack of process information on PCK development, and few studies built on previous research designs or results.

Cochran-Smith et al. (2016) found that most research on coursework employed a research design involving broad interventions (e.g., use of modelling, specific assignments, or activities such as analysing video or observing in schools). A large body of research on teacher education fieldwork

used primarily qualitative research methods, primarily interviews. Cochran-Smith et al. concluded that the research within this field is conducted largely by teacher educators in their own courses and that most studies used qualitative methodologies and had a small sample size. They emphasised that researchers have pointed to the dominance of such research designs, and they concluded that

nearly all previous reviews have recommended that in addition to these, teacher preparation also needs more larger-scale research studies, studies that use data from regional and national data bases, genuinely longitudinal studies, studies that use well-established research instruments, and multisite studies that are not limited to the features and idiosyncrasies of particular programs. (Cochran-Smith et al., 2016, p. 513)

Similarly, Orland-Barak (2016) found that most studies on mentoring are small-scale case studies focusing on local or national contexts. She concluded that the field is conceptually and methodologically fragmented and needs to work to create a “more integrative, conceptually grounded research agenda across contexts and settings” (Orland-Barak, 2016, p. 133). She claimed that this work demands more sophisticated and interconnected analytical frameworks for the examining of the same core questions across national border.

In sum, across these reviews, serious concerns were raised about the research designs and methods used within the body of research on practice-based teacher education, as well as the conceptual fragmentation within this field. Overall, the research questions trending within this body of research can be answered only to a limited extent through the commonly used research designs and methods. The reviews argued, for instance, that scarce evidence exists on the effects of teacher education coursework or fieldwork because its impact on teaching practice or on pupils’ learning is unknown. Rather, effects are measured through interviews or tests as changes in teacher candidates’ conceptual understandings of a subject matter or their conceptual understandings of teaching practice. While this is important knowledge, whether conceptual change actually leads to behavioural change is unknown (Bransford & Schwartz, 1999), so the pressing questions in the field of practice-based teacher education remain unanswered. Cochran-Smith et al. (2016), for instance, concluded that even if teacher education coursework can influence teacher candidates’ beliefs, it is unclear whether and how teacher candidates’ new beliefs and understandings enable them to navigate the complex tasks of teaching.

In their review, Floden and Meniketti (2005) argued that the lack of evidence within this body of research might be due to the difficulties in measuring effects in the complex context of teachers’ learning, as well as the complex relations between teachers’ learning and effects on pupils’ learning. Nevertheless, to find answers to the urgent questions within this field, there is a need for more sophisticated small-case research designs and a joint effort to build upon existing research, using existing instruments and creating common definitions of

terms. This can be done via a research programme (Zeichner & Conklin, 2008) or in research centres (Clift & Brady, 2005). Furthermore, although they demand a great deal of resources, there seem to be strong arguments for more large-scale, comparative, and longitudinal studies, which the reviews claimed to be lacking within this body of research (see, e.g., Clift & Brady, 2005; Cochran-Smith et al., 2016).

Issues concerning validity

All reviews pointed to severe problems concerning the validity of the reviewed research. The trends in these issues found in the individual reviews are outlined in Table 4.

Table 4. Issues of validity found in the reviews

Research review	Issues of validity
Clift & Brady (2005)	No well-developed theoretical framework Scarcity of description of data collection and analysis
Floden & Meniketti (2005)	Need for improved measures, national and international datasets, and sharpened vocabulary
Zeichner & Conklin (2008)	Ambiguous definitions Self-reports
Berry, Depaepe, & Van Driel (2016)	Few systematic studies Lack of instruments to measure pedagogical content knowledge Few studies built on previous studies
Cochran-Smith et al. (2016)	Small qualitative (self-) studies Need for larger-scale studies, data from regional and national databases, longitudinal studies, and multisite studies Need for studies using well-established research instruments
Orland-Barak (2016)	Need for more studies juxtaposing competing research lenses to address the same core issues

While reviewing research on methods courses and fieldwork, Clift and Brady (2005) argued that insufficient evidence exists about the impacts and long-term effects of these courses. They concluded that within this body of research,

researchers employed multiple frameworks with insufficient articulation among researchers within a content area, much less across content areas.... In many studies, the literature reviews did not elaborate on either the theoretical foundations or the relevant content-area research. More troubling was the scarcity of the descriptions of data collection and analysis. These were often so sparse that repeating the studies would be impossible. (Clift & Brady, 2005, pp. 332–333)

Similarly, as Floden and Meniketti (2005) found extremely thin evidence on the effects of coursework, they argued for the need to improve measures of teachers' skills, knowledge, and dispositions, as well as the need to agree on what effects should be studied and how these should be measured. They highlighted the need to create and use national and international datasets, and they urged researchers to draw on previous research to sharpen the vocabulary for describing college coursework.

Zeichner and Conklin (2008) argued that research on the effects of teacher education programme design suffers from ambiguous definitions (e.g., of programme structures, fieldwork organisation, and amount of fieldwork), as well as a heavy reliance on self-reports. They concluded that there is little evidence of the effects of programme structure on student learning because programme structure features are hard to define.

Berry et al. (2016) claimed that there are few systematic studies within their scope of research, possibly due to the lack of instruments for measuring PCK and the fact that few studies built on previous research designs or research results. They argued that there is a need for answers to pressing questions such as whether there is an "ideal sequence" in terms of what to focus on when developing PCK in preservice teachers and which PCK elements should be emphasised in developing a good foundation for PCK development (Berry et al., 2016, p. 380).

In their review, Cochran-Smith et al. (2016) noted problematic aspects of the wide range of self-studies and other relatively small qualitative studies about teacher preparation practice. Although some previous reviews discounted these studies, Cochran-Smith et al. acknowledged their significant contributions. They argued that because these studies were conducted by teacher educators using their own courses, programmes, and partnerships as research sites, many of these studies can use the insider perspective to pose complex questions and generate critical insights about the practice of teacher education. Nevertheless, in concordance with earlier reviews, Cochran-Smith et al. also argued that the small sample sizes of the reviewed studies limit the generalisability of the results. Additionally, since few of the studies followed teacher candidates beyond the completion of their courses, little is known about the persistence of results over time. Because the studies paid scant attention to connecting what teacher candidates learned from their preservice preparation to their classroom teaching or to pupils' learning, they offered little evidence about the impact of university-based teacher education programmes. Cochran-Smith et al. concluded that there is a need for more larger-scale research studies, studies that use data from regional and national databases, genuinely longitudinal studies, and multisite studies. They also called for studies that use well-established research instruments.

Orland-Barak (2016) argued that within the field of research on mentoring, there should be efforts to make methodological and conceptual connections

between various research strands to better understand the complexity and richness of mentoring. For instance, knowledge about the mentors' thinking and development processes should be linked with evidence on the mentees' practical teaching.

To summarise, four trends concerning issues of validity emerge: (a) a lack of transparency, (b) the use of vague concepts, (c) a lack of high-quality measures and instruments, and (d) a reliance on self-report and single-case studies. The following sections discuss the challenges these trends impose on research on practice-based teacher education in terms of the overall quality and generalisability of the research.

Challenges in researching practice-based teacher education

Research quality

The first trend, the lack of transparency across the reviewed studies, is problematic because it makes it impossible to assess other validity measures of the research. Transparency is a validity measure put forward by Auerbach and Silverstein (2003); Walsh (2003) used the term "dependability" to describe a similar measure. If all steps of the research process are not transparent, it is difficult for the reader to evaluate the accuracy of the data (Clift & Brady, 2005). This has to do with the descriptive validity (Maxwell, 2013) or credibility (Glaser & Strauss, 1967; Walsh, 2003) of the research. If the researchers are not being transparent by using excerpts of data to illustrate how they came to their conclusions, the reader cannot assess whether the interpretations of the data are plausible. This would be a threat to the interpretive validity (Maxwell, 2013), conformability (Walsh, 2003), and justifiability (Auerbach & Silverstein, 2003) of the research.

The second trend, the use of vague concepts within this body of research means that researchers are not clearly stating the definitions and concepts they used or the ways they operationalised the key concepts in their studies (Clift & Brady, 2005; Floden & Meniketti, 2005; Orland-Barak, 2016; Zeichner & Conklin, 2008). If these operationalisations and definitions are not clear, then neither are the research findings, as the reader does not know if the research measures what it claims to be measuring. This has to do with the construct validity (Hammersley, 2010; Kleven, 2008) of the research. Furthermore, it is problematic when researchers examine different phenomena using the same concepts and terms, or when they use different terms to describe the same phenomena. Although Cochran-Smith et al. (2016) identified what seems to be a common understanding of teaching and learning as a social activity across this body of research, placing this research primarily within a sociocultural theoretical frame, the lack of common operationalisations of many key concepts

is problematic. Thus, these reviews argued that the field lacks a shared, explicit, and clear language. This might indicate challenges related to the research quality within this body of research, as well as its ability to accumulate knowledge.

This leads to the third trend, the lack of high-quality measures and instruments (Berry et al., 2016; Cochran-Smith et al., 2016; Floden & Meniketti, 2005). Such instruments and measures are explicit and transparent (Borko et al., 2007; Grossman & McDonald, 2008; Hammersley, 2010; Zeichner, 2005) and therefore constitute important tools for enhancing the validity of research. These instruments can be thoroughly scrutinised, criticised, and tested for reliability and validity through replication by similar studies in other contexts. Unfortunately, the field of research on teacher education has been characterised by a low degree of accumulation of knowledge (Borko et al., 2007), perhaps because the field has been ridden by paradigmatic wars and a low degree of theoretical and methodological consensus.

The fourth and final trend is the reliance on self-reports and single-case studies (Cochran-Smith et al., 2016; Floden & Meniketti, 2005; Zeichner & Conklin, 2008). One important strategy to enhance the validity of research is to use triangulation (Creswell, 2013; Maxwell, 2013), meaning a systematic cross-checking of information and conclusions through the use of multiple methods, procedures, investigators, data sources, and theoretical perspectives (Maxwell, 2013). This might be difficult to achieve in small-scale, single-case research, which brings us to issues of generalisability concerning the reviewed research.

Generalisability of findings

Due to challenges in research funding (e.g., Clift & Brady, 2005) and the suitability of small-scale studies for answering some of the remaining questions in the field of research on practice-based teacher education, small-scale studies will probably always be common in this research field. The reliance on small-scale and single-case research within this body of research calls for greater methodological efforts in terms of issues of validity and generalisability (e.g., Clift & Brady, 2005; Floden & Meniketti, 2005). In 1989, Schofield identified a consensus within the field of qualitative research regarding the ability to generalise based on case studies. However, in 2009, Eisenhart argued that this consensus seemed to have disappeared. She wondered if this was due to the argument that qualitative research by nature cannot be generalised.

Qualitative research is different from quantitative research in that it has to abandon the statistical principles of probability; as a result, generalisations in statistical terms are impossible (Gobo, 2008). Because the ability to generalise has to do with sampling, Gobo (2008) established a theory of idiographic sampling. He argued that even if one abandons the statistical principle of probability, one can keep the principle of variance in mind while sampling cases. Thus, he asserted that through a sample of typical cases, for instance, one can generalise because the cases on their own can represent a significant feature

of a phenomenon. He argued that a sampling of cases with maximum variation allows for a type of generalisation called comparative inference. This type of generalisation is possible if the cases represent all the forms of heterogeneity in a target population but are simultaneously sufficiently homogeneous with the type that the researcher wants to examine. However, information about the target population is often insufficient, so one cannot know if the cases are typical or if they provide maximum variation. This calls for other types of generalisations.

Eisenhart (2009) claimed that there are numerous ways to generalise qualitative research and pointed to a spectrum of classical qualitative work that has done so. She highlighted theoretical generalisations (i.e., theoretical inferences by Davies [2008] and analytic generalisations by Yin [1994]) as especially promising. Cases are sampled not necessarily to be representative of the population but based on the extent to which they are likely to develop, refine, or reject a theory. Similarly, Guba and Lincoln (1982) and Denzin (1983) talked about the creation of a working hypothesis based on the findings of a case, and the transferability and fittingness of these findings to other contexts. Glaser and Strauss (1967) proposed their grounded theory, arguing that theory can be made inductively based on a saturation of information from empirical data. Others have argued that generalisations based on qualitative data have a limited capability to explain causal mechanisms found in statistical generalisations (Connolly, 1998), or that the reader needs to take responsibility for making generalisations based on the descriptions of the research (Merriam, 1998). Stake (1978) claimed that a case can be used to find the principal features of a phenomenon. Looking across cases, one can synthesise and make meta-analytic generalisations through techniques such as the case survey method (Yin & Heald, 1975), the qualitative comparative method (Ragin, 1987), and multisite analysis (Stake, 2006)—all strategies for aggregating data across qualitative cases by identifying patterns. Another strategy called meta-ethnography (Noblit & Hare, 1988) looks across studies on similar topics and identifies similar concepts or themes. These concepts are then translated back and forth between the studies to identify more generalisable concepts, which seems like a promising method for meeting the concerns raised in the reviews about the lack of a common language in the field of research on teacher education.

Concerning the validity and generalisability of qualitative research, numerous overlapping concepts and terms are used to illustrate similar or slightly different aspects. These few examples of work to develop frameworks for generalisation are vital, and more researchers should develop them further to advance the field of research on practice-based teacher education.

A shift in research on practice-based teacher education?

Although challenges clearly exist within this body of research, many of the reviews referred to a shift in research on teacher education around the year 2000

towards more cross-case studies, longitudinal studies, and large-scale studies. However, few of these studies were included in the reviews, because few were published at the time. To further investigate this shift in research, I searched for cross-case studies, longitudinal studies, and large-scale studies published after 2000. Since few such studies have been published, conference papers were also included in this search. The studies were chosen to illustrate the variety and rigour of research designs across these studies. In the following, I will outline some of these studies to illustrate the shift emphasised by these reviews and to point in the direction of a research agenda for practice-based teacher education.

The Carnegie-funded New York City Pathways Study clearly addressed the concerns expressed in the reviews, as it was a large-scale, multisite, and multimethod study. Cochran-Smith et al. (2016) partly included this study in their review, and more research from this study has since been published. Because of the recent interest in alternative programmes and pathways to teaching, the New York City Pathways Study examined the features of these different pathways and their impacts on (a) where teachers teach, (b) how long they remain teachers, and (c) student achievements. The study investigated more than 100 different pathways to teaching and used a range of methods and data sources, including programme documents and interviews with key informants from all pathways, surveys of more than 3,200 teacher candidates and more than 6,000 first-year teachers, extensive administrative data on individuals during their education and professional careers, information about the districts and schools in which these teachers work, and student test score data. This demanded a complex research design, as illustrated in Figure 1.

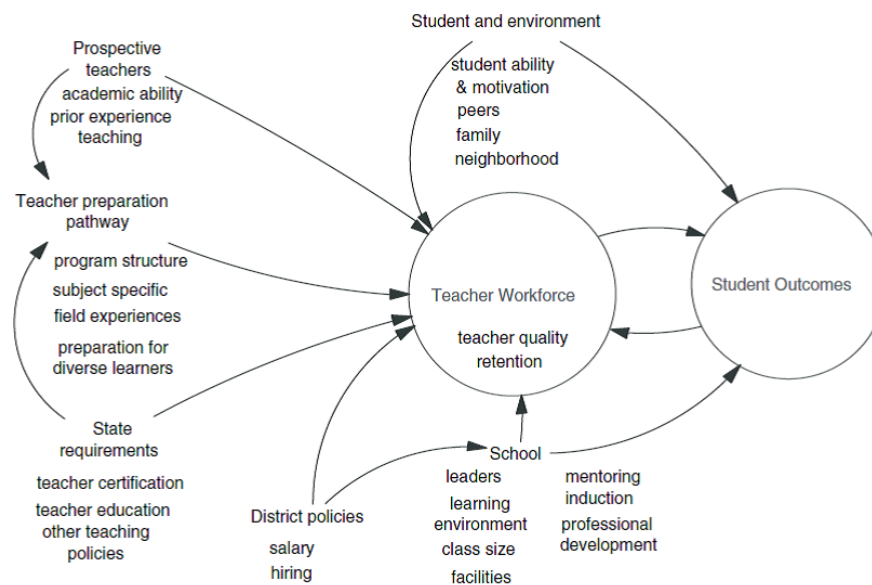


Figure 1. Conceptual framework of the New York City Pathways Study.

Figure 1 shows how this study takes a complex set of interactions into account while investigating the impacts of different pathways on student outcomes. It illustrates how the study design controls for the student and environment, the

school, the district and state policy, the teacher education programme design, and the prospective teachers' prior knowledge and experience. The study contributed important knowledge about these different features and how they affect student learning. It also contributed to the development of instruments such as a teacher candidate survey.

Although smaller, the Action-Oriented Teacher Knowledge Study is also a multisite, multimethod study supported by the Lifelong Learning Programme of the European Union. It involved 309 teacher candidate participants from Estonia, Finland, Spain, and the Netherlands and examined guided reflection as a way to enhance teacher candidates' enactment of and learning from practice. The study design reflects the complexity of examining reflection (Figure 2).

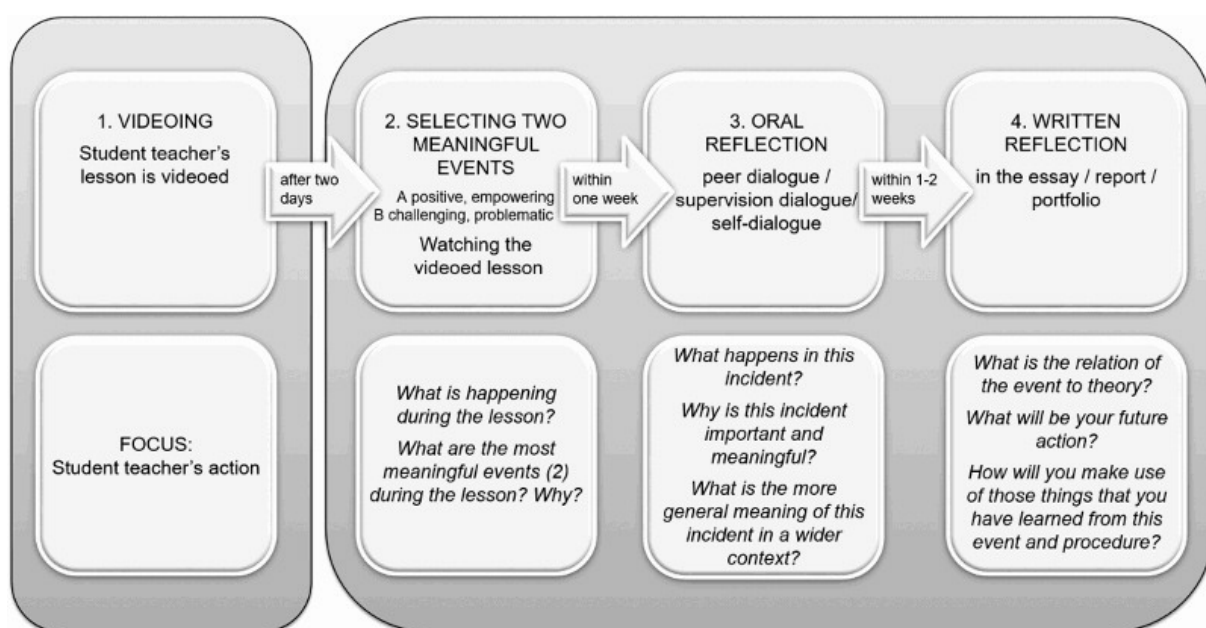


Figure 2. Study design of the Action-Oriented Teacher Knowledge Study.

Figure 2 displays the multiple phases and data sources of the study. The candidates filmed themselves and chose some critical incidents to reflect upon orally with peers and supervisors as well as individually in writing. These different modes of reflection constituted the data sources, which were analysed according to a common framework across the countries. As such, the study not only addressed the call by the reviews for more cross-case research studies, but also carefully built upon previous research and developed an instrument for analysing reflection in teacher education.

The Configuration of Teacher Education as a Professional Field of Practice (Tatto & Hordern, 2017) is a comparative study of mathematics education in teacher education. The study used data from the Teacher Education and Development Study in Mathematics, the first international comparative study of outcomes of mathematics teacher education, with representative samples of teacher education programmes from 17 countries. In this study, the researchers

looked at the course syllabi programmes in Germany, Poland, Singapore, and the United States. Data were collected through a collaborative agreement on different contextual factors to ensure comparability. For instance, the researchers agreed upon terms such as programme, curriculum, and pedagogical content knowledge, thereby developing a common language, which was a concern raised in the reviews.

Youngs, Cohen, Drake, Anagnostopoulos, and Casa (2017) recently began a comparative longitudinal study to identify features of teacher education coursework that lead to high-quality teaching. The study is to track 300 elementary teaching candidates beginning in their final year in the teacher preparation programmes at six universities in the United States and follow them into their first and second years of teaching. It will focus on the subjects of mathematics and language arts. The researchers will use videos of teacher candidates' teaching as their data source. Two instruments will be used to measure outcomes of the quality of teaching: the Protocol for Language Arts Teaching Observation instrument and the Mathematics Scan instrument.

Finally, the Coherence and Assignments in Teacher Education (CATE) study (Hammerness & Klette, 2015) is a multisite, multimethod study that examined the extent to which teacher education programmes worldwide are designed around a common vision of teaching and learning, the extent to which they are coherently designed, and the extent to which they provide opportunities to learn that are grounded in practice. Starting out with six teacher education programmes in Norway, Finland, and California, the study has since extended to programmes in Chile, Cuba, Estonia, the Netherlands, Singapore, and Indonesia. Building upon existing research, the CATE study developed an analytical framework for investigating coherence in teacher education programmes and operationalised what connecting theory and practice might mean. It built upon the survey instruments used in the Pathways study and developed an observation protocol for investigating opportunities to enact practice within teacher education coursework. In addition to survey and observation data, the CATE study included other data sources such as programme documents and interviews with programme directors, teacher educators, and teacher candidates.

Conclusion: Towards a research agenda for practice-based teacher education

Although this literature review relied on commonly cited reviews in the field, individual studies not included in this review might provide nuance to the broad picture painted in this article. To summarise, there are promising developments in the field of research on practice-based teacher education in terms of larger-scale, cross-case, and longitudinal studies. These point in the direction of a new agenda for research on practice-based teacher education where such studies can

complement smaller-scale research studies. Nevertheless, some precautions for the continued development of this field of research must be highlighted.

Regarding the focus of research on practice-based teacher education, there is need for a more targeted and systematic examination of specific questions in the field. This is important to be able to accumulate knowledge and build on each other's work rather than continuously reinventing the wheel. In the latest and most comprehensive research review, Cochran-Smith et al. (2016) called the field "sprawling" and suggested four areas on which future research efforts can concentrate: (a) key features of effective teacher preparation, (b) ways to influence teacher candidates' understandings and beliefs, (c) effective ways to shape teacher candidates' teaching strategies, and (d) research connecting these issues to pupils' learning. Most of these questions have already been examined for many years, and seem to be important and central questions to this field of research. However, as this review has shown, such research questions might necessitate research designs other than those established in the field.

Regarding research designs, some promising efforts have been made to bring the field of research on practice-based teacher education towards more longitudinal and large-scale studies, including the development and use of common instruments, as called for by reviewers in the field. These efforts contribute to increased systematisation and transparency in this field of research and should be a priority on the research agenda. But this work has only started and must be continued in the years to come. Moreover, a greater systematisation of the use of smaller scale studies and self-report data is needed, as is the need for the inclusion of other data sources such as observations.

When it comes to issues of validity, this article illustrated the sprawling nature of the field of research methodology—for instance, by pointing to the various terms used for the same or slightly different validity measures in qualitative research. There is a need to further develop research methodology as a field and to take on the work of generating a common methodological language for qualitative measures of validity and generalisability in smaller-scale qualitative research.

Nevertheless, there are indications that the field of research on practice-based teacher education might experience a shift from being "sprawling" towards being more aligned, as illustrated through the newer research studies above. This sets the research agenda for the future. Although the field still faces great challenges in terms of methodological transparency and systematisation, the recent shift might contribute to providing more answers to the pressing questions in this field in the near future.

About the author

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