

Information for the March 22, 2013 TeachingWorks Journal Club Meeting

We will discuss the following two articles in this meeting, each of which is summarized at the end of this document:

- 1. Berry, Amanda, & Van Driel, Jan H. (2013). Teaching About Teaching Science: Aims, Strategies, and Backgrounds of Science Teacher Educators. Journal of Teacher Education, 64(2), 117-128.**
- 2. Kleickmann, Thilo, Richter, Dirk, Kunter, Mareike, Elsner, Jürgen, Besser, Michael, Krauss, Stefan, & Baumert, Jürgen. (2013). Teachers' Content Knowledge and Pedagogical Content Knowledge: The Role of Structural Differences in Teacher Education. Journal of Teacher Education, 64(1), 90-106.**

In addition, bibliographic information is below for other relevant articles published since the January 2013 meeting.¹

--

Aguirre, Julia M., Turner, Erin E., Bartell, Tonya Gau, Kalinec-Craig, Crystal, Foote, Mary Q., Roth McDuffie, Amy, & Drake, Corey. (2013). Making Connections in Practice: How Prospective Elementary Teachers Connect to Children's Mathematical Thinking and Community Funds of Knowledge in Mathematics Instruction. Journal of Teacher Education, 64(2), 178-192.

This study examines the ways prospective elementary teachers (PSTs) made connections to children's mathematical thinking and children's community funds of knowledge in mathematics lesson plans. We analyzed the work of 70 PSTs from across three university sites associated with an instructional module for elementary mathematics methods courses that asks PSTs to visit community settings and develop problem solving mathematics lessons that connect to mathematical practices in these settings (Community Mathematics Exploration Module). Using analytic induction, we identified three distinct levels of connections to children's mathematical thinking and their community funds of knowledge evidenced in PSTs' work (emergent, transitional, and meaningful). Findings describe how these connections reflected different points on a learning trajectory. This study has implications for understanding how PSTs begin to connect to children's mathematical funds of knowledge in their teaching, a practice shown to be effective for teaching diverse groups of children.

Berry, Amanda, & Van Driel, Jan H. (2013). Teaching About Teaching Science: Aims, Strategies, and Backgrounds of Science Teacher Educators. Journal of Teacher Education, 64(2), 117-128.

Despite pressing concerns about the need to prepare high-quality teachers and the central role of teacher educators (TEs) in this process, little is known about how TEs teach about teaching specific subject matter, and how they develop their expertise. This empirical study focuses on the specific expertise that science TEs bring into teacher education. Individual interviews and story lines were conducted with 12 experienced science TEs from four different teacher education institutions in Australia and the Netherlands, to gain insight into their aims for teaching about science teaching, and how their expertise has developed on the basis of their professional background and experiences. The findings of this exploratory study reveal similarities among the

¹ For the March 22, 2013 TeachingWorks journal club we considered the following journals: *Journal of Teacher Education* (March/April 2013; 64 (2), January/February 2013; 64(1)), *American Educational Research Journal* (February 2013; 50(1)), *Elementary School Journal* (the March issues was not yet out in time for consideration for this journal club meeting), *Journal of Curriculum Studies* (Volume 45, issue 1), *Teachers College Record* (Volume 115, Number 1, Volume 115, Number 2), *Educational Evaluation and Policy Analysis* (March 2013; 35(1)), *Teaching and Teacher Education* (Volume 30, Volume 31), *Journal of Education for Teaching: International Research and Pedagogy* (Volume 39, Issue 2).

concerns of these TEs and yet considerable diversity among their approaches. The study aims to contribute to a better understanding of science TEs' work and the development of a pedagogy of science teacher education.

Birky, Geoffrey D. , Chazan, Daniel, & Morris, Kellyn Farlow. (2013). In Search of Coherence and Meaning: Madison Morgan's Experiences and Motivations as an African American Learner and Teacher. Teachers College Record, 115(2).

This article offers a case study of the practice of one well-respected African American algebra teacher in an urban high school. This teacher's practice differs from that of many of her colleagues in its departure from the pacing and order of the district curriculum guide in search of an experience of coherence and meaning for her students. The article explores her reasons for making such decisions and the beliefs and knowledge that allow her to do so; some of her beliefs and motives seem to be rooted in her own experiences as an African American student, experiences that serve as a resource in her teaching.

Brayko, Kate. (2013). Community-Based Placements As Contexts for Disciplinary Learning: A Study of Literacy Teacher Education Outside of School. Journal of Teacher Education, 64(1), 47-59.

Community-based field placements have shown promise as a strategy for preparing teacher candidates to work in diverse, high-needs schools, but they have rarely been designed or researched with subject-area methods learning in mind. Drawing on data from observations, interviews, documents, and journals, the author investigated how placements in two case study community-based organizations (CBOs) shaped candidates' learning about literacy and literacy pedagogy. Using cultural historical activity theory as an analytic framework, the author found that contextual components in CBO activity systems guided teacher candidates to take up more complex theories of literacy, demonstrate unusual proficiency in engaging language-minority students in text-based conversations (a critical strategy for promoting reading and language development), and leverage teacher–student–family relationships in ways that enhanced pupils' literacy engagement and learning experiences. Findings highlight implications (related to literacy and other skill/subject areas) for prospective pupil learning, course-based mediation of community-based fieldwork, and placement site selection.

Brown, Keffrelyn D., & Goldstein, Lisa S. (2013). Preservice Elementary Teachers' Understandings of Competing Notions of Academic Achievement Coexisting in Post-NCLB Public Schools. Teachers College Record, 115(1).

This article highlights the contradictions that preservice teachers encounter when attempting to reconcile their own perspectives about academic achievement that emphasize growth and progress with those found in larger policy and school contexts that focus on success and mastery of common learning standards. The authors offer that using the more precise terms academic progress and academic success will clarify these contradictory perspectives on academic achievement and illuminate the complexities that teachers encounter when preparing to teach in a post–No Child Left Behind context.

Caspersen, Joakim. (2013). The valuation of knowledge and normative reflection in teacher qualification: A comparison of teacher educators, novice and experienced teachers. Teaching and Teacher Education, 30(0), 109-119.

The transition from teacher education to work in schools has been described as an “epistemic clash”. Teacher educators', novice teachers' and experienced teachers' valuation of the academic, practical and normative demands of teaching are compared using survey data from teacher education and schools. All groups value academic knowledge and practical skills highly. Teacher educators take a more positive attitude toward inclusion, and differ in their views of the normative demands of teaching. The role of teacher education as a corrective to the contemporary demands made of schools through political and international policy initiatives is emphasized.

Chazan, Daniel, Brantlinger, Andrew, Clark, Lawrence M. , & Edwards, Ann R. (2013). What Mathematics Education Might Learn from the Work of Well-Respected African American Mathematics Teachers in Urban Schools. Teachers College Record, 115(2).

This article outlines the research questions that organize the two cases that are at the heart of this special issue, introduces the theoretical perspectives behind the project from which the cases are drawn, and describes the selection procedures for the data corpus from which the articles in the issue were developed. It also explains the interrelationships among the six pieces in the issue. In doing so, the article problematizes contemporary discourse about urban education and presents an argument for what might be learned from the practices of well-respected African American teachers of high school mathematics in large, nonselective urban schools.

Clark, Lawrence M., Badertscher, Eden M. , & Napp, Carolina. (2013). African American Mathematics Teachers as Agents in their African American Students' Mathematics Identity Formation.

This article explores the work of two African American mathematics teachers, Madison Morgan and Floyd Lee, for the purposes of illuminating our collective understanding of the resources and perspectives African American teachers may access in the context of the teaching and learning of mathematics. Through the use of dimensions of students' mathematics identity development and teachers' socialization practices as analytic frames, we present an analysis of aspects of the two teachers' perspectives on teaching mathematics and classroom practices and discuss considerations when approaching conducting research on interactions between African American mathematics teachers and their African American students. We conclude this article with a framework through which we might consider the work of all mathematics teachers as they engage in the work of socializing their students toward (or away from) seeing themselves as competent, capable mathematics learners.

Clark, Lawrence M., Frank, Toya Jones, & Davis, Julius. (2013). Conceptualizing the African American Mathematics Teacher as a Key Figure in the African American Education Historical Narrative. Teachers College Record, 115(2).

Calls to increase the number of minority teachers in U.S. schools are plentiful, yet the basis for these calls is underspecified and undertheorized. In an effort to better understand the role of race and context in teacher–student interactions, this article considers the African American mathematics teacher as both historical figure and conceptual construct. The authors discuss the importance of examining the role, responsibilities, and work of African American teachers in an academic domain-specific context, namely mathematics. After a brief overview of what the literature reports African American teachers in general bring to their practice, the authors examine and discuss intersections of intertwining historical timelines for the purposes of raising questions about the role and responsibilities of African American mathematics teachers across time. The article concludes with a challenge for researchers to interrogate, challenge, critique, and build on conceptualizations of the African American mathematics teacher as an entity that represents a unique confluence of experiences, perspectives, dispositions, and knowledge domains critical to the education of all students.

Cobb, Paul, & Jackson, Kara. (2013). Lessons for Mathematics Education From the Practices of African American Mathematics Teachers. Teachers College Record, 115(2).

In this commentary, we discuss the lessons we learned from case studies of two African American mathematics teachers, thereby endorsing the claim made by the contributors to this special issue that the insights they gained are not restricted to mathematics teaching in nonselective urban schools but can also inform the field more generally. We then focus on differences in the two teachers' goals for students' mathematical learning and clarify that they were consequential and constrained the types of purposes that the teachers could convey to their students for engaging in mathematical activity. We go on to argue that high expectations for all students' learning are not by themselves sufficient for their development of mathematical proficiency and discuss the importance of supporting teachers' development of specific instructional practices that enable their students to meet those expectations. Finally, we suggest that it is critical to situate the ways in which teachers draw on their cultural resources with respect



to the school and district settings in which they work and in which they refine and elaborate their instructional practices.

Dang, Thi Kim Anh. (2013). Identity in activity: Examining teacher professional identity formation in the paired-placement of student teachers. *Teaching and Teacher Education*, 30(0), 47-59.

This paper examines the evolution of the professional identities of student teachers (STs) in a paired-placement teaching practicum in Vietnam. The study draws on activity theory, its notion of contradiction, and Vygotsky's concepts of ZPD and perezhivanie, to identify the factors driving the intricate learning process. Opportunities for learning were initially manifested in conflicts within the teacher pair, for example negotiation of their multiple identities, as friends, students and teachers in training. However, within the framework of planned and supervised collaboration, the STs resolved most of their conflicts constructively and experienced qualitative development in their teaching identities.

Dierking, Rebecca C., & Fox, Roy F. (2013). "Changing the Way I Teach": Building Teacher Knowledge, Confidence, and Autonomy. *Journal of Teacher Education*, 64(2), 129-144.

In this article, the authors examine the effect of a National Writing Project professional development model on a group of middle school writing teachers. The authors examine how contact with other professionals in intensive week-long sessions as well as mentoring from the professional development coach affected the teachers' concept of themselves as professionals, as writers, and as colleagues, as well as how this attitudinal change affected their classrooms and students. The authors begin with an overview of recent scholarship on teacher "empowerment," efficacy, and the National Writing Project. The authors then explicate their methodology and findings from this 2-year study, including how advanced knowledge builds confidence, how autonomy sustains empowerment, and how support can strengthen teachers, whereas other disempowering forces can negatively affect teacher actions. Implications for other professional development models as well as for future National Writing Project endeavors are included.

Eckert, Sarah Anne. (2013). What Do Teaching Qualifications Mean in Urban Schools? A Mixed-Methods Study of Teacher Preparation and Qualification. *Journal of Teacher Education*, 64(1), 75-89.

The inequitable distribution of teachers in high-needs areas and the failure of teacher education programs have recently become focal points in the discussion of how to provide a quality education to all students. To address this concern, reformers have responded by mandating specific qualifications for teachers in all schools. These mandates have been established, however, without a real understanding of what these qualifications mean. This article adopts a mixed-methods approach to understanding what qualifications measure for novice teachers in urban districts in terms of teacher efficacy and one-year retention. Analysis of data from the Schools and Staffing Survey (2009-2010) and qualitative interviews reveal that qualifications do predict teacher efficacy, to an extent, yet they do not predict teacher retention. More research needs to be done to identify measurable qualifications that can actually predict what will happen in the first year of teaching.

Edmond, Nadia, & Hayler, Mike. (2013). On either side of the teacher: perspectives on professionalism in education. *Journal of Education for Teaching*, 39(2), 209-221.

This article brings together two studies which contribute to the examination of the nature of professionalism in education by focusing on the perspectives of two under-researched groups namely teaching assistants and teacher educators working either side of the school teacher. The projects were conducted in, and framed by, the UK policy context of public sector modernization and cuts, and raise issues of relevance to international debates on notions of professionalism in education in a context of neo-liberal policy and austerity. The studies drew upon different approaches including autoethnography, life history and discourse analysis. The authors examine the formation and representation of professional identity in education through the discourses of professionalism of teaching assistants and teacher educators. Professionalism is articulated

through three themes in the accounts; non-standard professional transformations, role ambiguity, and the role of classroom experience and higher education in the development of professional identities. Through these themes the perspectives of teaching assistants and teacher educators locate the notion of teacher professionalism within a broader concept of professionalism in education providing alternatives to the discourse of imposed policy, and the authors reflect upon the ways in which these voices contribute to the wider international debate on professionalism in education.

Grigg, Jeffrey, Kelly, Kimberle A., Gamoran, Adam, & Borman, Geoffrey D. (2013). Effects of Two Scientific Inquiry Professional Development Interventions on Teaching Practice. *Educational Evaluation and Policy Analysis*, 35(1), 38-56.

In this article, we examine classroom observations from a 3-year large-scale randomized trial in the Los Angeles Unified School District (LAUSD) to investigate the extent to which a professional development initiative in inquiry science influenced teaching practices in 4th and 5th grade classrooms in 73 schools. During the course of the study, LAUSD introduced an additional districtwide scientific inquiry professional development initiative, which complicates the experimental analysis but allows us to conduct a quasiexperimental analysis of the second Multilevel models predicting the presence of science inquiry in observed classroom lessons show that both interventions increased the incidence of inquiry-based science teaching, but the impact was limited to selected features of the inquiry process. We also found that the experimental impacts on teaching practice correspond with the features of scientific inquiry to which the teachers were most frequently exposed during the professional development.

Hadar, Linor L., & Brody, David L. (2013). The Interaction Between Group Processes and Personal Professional Trajectories in a Professional Development Community for Teacher Educators. *Journal of Teacher Education*, 64(2), 145-161.

This study explores the interaction between transformative processes in which a group of teacher educators became a professional development community (PDC) and the individual progress of these instructors through the professional development course on the topic of thinking education. Twelve teacher educators who participated in one of three yearlong programs were each interviewed three times. Other data sources include reflective writing of the participants, field notes, and recordings of the PDC meetings. Findings show that both breaking of isolation in the group and talk about student learning were essential in promoting individual progression toward change that entailed developing awareness of the possibility of infusing thinking into college-level teaching and the development of dispositions to do so in their courses. Factors that enhanced and hindered dispositional change are explicated in the findings and discussion.

Hamman, Doug, Wang, Eugene, & Burley, Hansel. (2013). What I expect and fear next year: measuring new teachers' possible selves. *Journal of Education for Teaching*, 39(2), 222-234.

Possible selves theory describes the relation between self-concept and regulation of future-oriented behaviours. This theory helps conceptualise issues related to teacher development, including preparation and retention, but few researchers have done so. The validation of a Likert-type instrument intended to measure "new teacher possible selves" is described. Student teachers in the United States (n=335) completed the new measure in their final practicum semester. Results from two confirmatory factor analyses indicate that data fit well the models of new teacher expected and feared possible selves. Limitations and future research directions are discussed.

Iredale, Alison, Orr, Kevin, Bailey, Wayne, & Wormald, Jane. (2013). Confidence, risk, and the journey into praxis: work-based learning and teacher development. *Journal of Education for Teaching*, 39(2), 197-208.

This article examines the relationship between confidence and risk in relation to the initial education and continuing professional development (CPD) of teachers. The context for this examination is the Lifelong Learning Sector (LLS) in England, which sits between secondary schools and universities, and the discussion is illustrated with data gathered from trainee

teachers in this sector. Understandings of confidence are considered and it is argued that the inculcation of confidence through risk-taking is important for new teachers in their journey to praxis. The article concludes by arguing that the transformative potential of critical engagement with professional knowledge on teacher education courses and through work-based learning (WBL) should be balanced with the need for the good and appropriate time necessary for the risky political act of reflection, not merely the immediate technical evaluation of practice.

Johnson, Whitney, Nyamekye, Farhaana, Chazan, Daniel, & Rosenthal, Bill. (2013). Teaching with Speeches: A Black Teacher Who Uses the Mathematics Classroom to Prepare Students for Life. Teachers College Record, 115(2).

This article focuses on a well-respected young Black male algebra teacher in an urban high school whose practice differs from that of many of his colleagues in one regular feature of classroom interaction, what the authors have come to call “speeches.” This article lays out examples of the speeches and, using themes from the literature on culturally relevant classroom management, illustrates how these themes are regularly present throughout the speeches and capture the stance this teacher takes in his interactions with students. The cultural resources that this young teacher brings to his practice challenge educational researchers to conceptualize the role of such resources in teaching and teacher educators to consider the recruitment of teachers who have such resources, as well as how to teach prospective teachers to develop and utilize such resources in their teaching.

Kleickmann, Thilo, Richter, Dirk, Kunter, Mareike, Elsner, Jürgen, Besser, Michael, Krauss, Stefan, & Baumert, Jürgen. (2013). Teachers’ Content Knowledge and Pedagogical Content Knowledge: The Role of Structural Differences in Teacher Education. Journal of Teacher Education, 64(1), 90-106.

Pedagogical content knowledge (PCK) and content knowledge (CK) are key components of teacher competence that affect student progress. However, little is known about how teacher education affects the development of CK and PCK. To address this question, our research group constructed tests to directly assess mathematics teachers’ CK and PCK. Based on these tests, we compared the PCK and CK of four groups of mathematics teachers at different points in their teaching careers in Germany. Confirmatory factor analyses showed that PCK and CK measurement was satisfactorily invariant across the teacher populations considered. As expected, the largest differences in CK and PCK were found between the beginning and the end of initial teacher education. Differences in the structures of teacher education were reasonably well reflected in participants’ CK and PCK.

Kumar, Revathy, & Hamer, Lynne. (2013). Preservice Teachers’ Attitudes and Beliefs Toward Student Diversity and Proposed Instructional Practices: A Sequential Design Study. Journal of Teacher Education, 64(2), 162-177.

This study draws on insights from achievement goal theory and multicultural education to examine the interrelated nature of preservice teachers’ biases and beliefs regarding culturally diverse students and the kind of instructional practices they are likely to pursue. Cluster analysis of cross-sectional data ($n = 784$) suggests that approximately 25% of preservice teachers explicitly endorsed some stereotypic beliefs about poor and minority students and expressed some discomfort with student diversity. Analyses of variance results provide evidence that preservice teachers were significantly less biased and prejudiced and more likely to endorse adaptive instructional practices by the time they were ready to graduate from the teacher education program than they were during their 1st year in the program. Paired t-test results based on longitudinal data ($n = 79$) suggest that some gains preservice teachers accrued midway through the program were lost when they were close to graduation. Implications of these findings are discussed.

Lambe, Jackie, McNair, Victor, & Smith, Ron. (2013). Special educational needs, e-learning and the reflective e-portfolio: implications for developing and assessing competence in pre-service education. Journal of Education for Teaching, 39(2), 181-196.

This article reports on the use of e-portfolios to assess aspects of a one year, post-graduate pre-service teacher education programme in Northern Ireland within the specific context of special needs education. The rationale for using an e-portfolio for programme assessment and the potential it offers in demonstrating a range of teaching competencies is examined, with participants in the study challenged to develop their individual e-portfolios by selecting and presenting evidence for assessment drawn from a wide range of sources. In so doing they were asked to reflect upon their personal, academic and pedagogical learning and development across the pre-service year. The article also reports on the individual student experience of building an e-portfolio and attitudes towards its use for assessment purposes within pre-service education and beyond. Finally, it considers the potential for using e-portfolios across all phases of teacher education.

Lee, Bridget, Cawthon, Stephanie, & Dawson, Kathryn. (2013). Elementary and secondary teacher self-efficacy for teaching and pedagogical conceptual change in a drama-based professional development program. *Teaching and Teacher Education, 30(0), 84-98.*

This mixed-methods research study explores the potential relationship between the teacher self-efficacy and pedagogical conceptual change. The study context was a drama-based instruction professional development model that specifically sought to facilitate pedagogical conceptual change. Significant differences were present between elementary and secondary teachers in self-efficacy for teaching and in pedagogical conceptual change. However, self-efficacy did not predict conceptual change. The independent variable (elementary and secondary teachers) was a significant moderator between years teaching experience and self-efficacy. We discuss the significance of these findings in light of teacher training and teacher effectiveness.

Michalsky, Tova, & Schechter, Chen. (2013). Preservice teachers' capacity to teach self-regulated learning: Integrating learning from problems and learning from successes. *Teaching and Teacher Education, 30(0), 60-73.*

Using a quasi-experimental design, we integrated systematic learning from problematic and successful experiences into teachers' preparatory programs and examined how such learning affected preservice physics teachers' capacity to teach students self-regulated learning (SRL). Results indicated that preservice teachers who contemplated both problematic and successful experiences improved more in their actual teaching of SRL strategies and in their actual arrangement of SRL environments, compared to preservice teachers who contemplated only problematic experiences. The current study suggests the need to integrate systematic learning from problematic and successful experiences into teachers' preparatory programs as means of developing preservice teachers' capacity to promote students' SRL.

Piwowar, Valentina, Thiel, Felicitas, & Ophardt, Diemut. (2013). Training inservice teachers' competencies in classroom management. A quasi-experimental study with teachers of secondary schools. *Teaching and Teacher Education, 30(0), 1-12.*

The current study evaluated the effectiveness of a training program for inservice secondary school teachers in classroom management. In a non-randomized pre-post-design, 19 teachers participated in a newly developed training (the intervention group) and 18 teachers participated in a control training (the control group). All participants reported better knowledge of classroom management after training. However, hypothesized positive effects on teachers' competencies and increased student engagement occurred only in the intervention group. These findings are supported by participants' reported high subjective validity of the training. Further research is needed to study sustainability of the observed effects.

Pourshafie, Tahereh, & Murray-Harvey, Rosalind. (2013). Facilitating problem-based learning in teacher education: getting the challenge right. *Journal of Education for Teaching, 39(2), 169-180.*

The problem-based learning (PBL) literature presents the shift from teacher-directed transmission models of instruction to facilitation as a challenge for PBL tutors. This article reports an in-depth thematic analysis of reflective written responses on PBL of 63 teacher education students enrolled at an Australian university. Attitudes, skills and knowledge represent three distinctive

dimensions of facilitation identified by students. Both content and pedagogical knowledge emerged as features of effective facilitators who students considered as: (1) displaying attitudes conveying belief in the capacity of learners; (2) assuming a humble posture of learning by not considering themselves the font of all knowledge; and (3) creating environments conducive to participation and mutual support through scaffolding and group work. Students indicated that PBL offered an effective approach to incorporate into their future teaching practice.

Schultz, Katherine, & Ravitch, Sharon M. (2013). Narratives of Learning to Teach: Taking on Professional Identities. *Journal of Teacher Education*, 64(1), 35-46.

This article examines the writing of new teachers in two different pathways into teaching—a university-based teacher education program and an alternative certification program. The teachers were members of a Narrative Writing Group formed by the authors to study how teachers construct a professional identity, to further understand the role of narrative and inquiry in teacher learning, and to add to conversations about the design of teacher preparation programs. An analysis of the teachers' narratives reveals that their professional identities were shaped by their membership in a range of knowledge communities, including the Narrative Writing Group and also their schools, network of friends, and the preparation programs. The narratives of professional identity development were shaped in relationship to other people, including mentor teachers and students. Knowledge and perspectives from this writing provide critical understandings about the importance of addressing teaching as professional practice that have the potential to shape the current conversation about teacher preparation.

Smith, Lisa F., Corkery, Gaynor, Buckley, Judy, & Calvert, Amanda. (2013). Changes in Secondary School Preservice Teachers' Concerns About Teaching in New Zealand. *Journal of Teacher Education*, 64(1), 60-74.

This study followed a cohort of preservice teachers ($n = 85$) in a 1-year secondary school program in New Zealand to examine their concerns about teaching in terms of what they are, how they are related to teaching efficacy, and how they are affected by practicum experiences. Before beginning the program and after each of two practica, participants completed the Teachers' Sense of Efficacy Scale (short form) and the Concerns About Teaching Scale. Focus groups ($n = 8$ each) were conducted after each survey administration. Results indicated that the participants' concerns about teaching became differentiated over time and with classroom experience; their sense of efficacy increased. Results are discussed in terms of practical implications for teacher education taking into consideration the relationships among teaching concerns, practicum experiences, views of teaching, and policy changes in New Zealand.

Southgate, Erica, Reynolds, Ruth, & Howley, Peter. (2013). Professional experience as a wicked problem in initial teacher education. *Teaching and Teacher Education*, 31(0), 13-22.

Professional experience in teacher education is explored through the conceptual lens of the wicked problem. Wicked problems are socially constructed and complex. This paper outlines what is at stake in the framing of the problem of professional experience and how constructions of the problem make it difficult to find enduring solutions. The tactical and strategic implications for finding solutions to professional experience are discussed. It is argued that teacher educators must simultaneously work on tactically resolving issues whilst also engaging in a more strategic, evidence-based dialogue on the purpose of professional experience, its models of delivery, and evidence of outcomes.

Wæge, Kjersti, & Haugaløkken, Ove K. (2013). Research-based and hands-on practical teacher education: an attempt to combine the two. *Journal of Education for Teaching*, 39(2), 235-249.

This article, based on the analysis of responses given by 27 students in initial teacher education, gives an account of how education theory can be conceived by students as relevant to their teaching practice. Research on teacher education in many countries has revealed that students regard theory and practice to be inconsistent or to belong to different worlds in initial teacher education. This may have a potentially negative effect on the teachers' opportunities for future professional development, as such development should be based on the ability to view one's own



teaching practice from a critical, theory- and research-based perspective. In the research and development project reported in this article, the PIL-project, the students' teaching practice was chosen as the pivotal point for all the other activities involved in the teacher education programme. Results indicate that when questions emerge from the students' own experience, theory is often found useful in discussing and understanding their practical experiences. The results further show that the students' choice of theory when discussing their teaching practice is eclectic. Students tend to choose theory with direct relevance to their daily tasks in the classrooms. The implication for initial teacher education is that the educational theory taught should more often address the immediate challenges faced by the students doing their teaching practice.

Wager, Anita A., & Foote, Mary Q. (2013). Locating Praxis for Equity in Mathematics: Lessons From and for Professional Development. *Journal of Teacher Education*, 64(1), 22-34.

In this article, the authors report on a study that contributes to a growing body of literature that considers professional development (PD) focused on mathematics and equity. The authors examined how lived experiences provide a foundation for the ways teachers take up equity in their mathematics teaching practice. The constructs of praxis and figured worlds are used to frame the study. In particular, teachers' identities in the figured worlds of standards-based mathematics, multicultural education, and equitable mathematics pedagogy were explored with a focus on how they contributed to where the teachers located praxis for equity in mathematics. The teachers' lived experiences and their participation in the PD were analyzed with an eye toward teachers' evolving identities and how they contribute to where teachers located praxis.

Wong, Ruth. (2013). The sustainability of change in teacher beliefs and practices as a result of an overseas professional development course. *Journal of Education for Teaching*, 39(2), 152-168.

This article examines whether there are changes in students' teaching practices as a result of their experiencing an overseas professional development course (PDC); the process of any such changes; and whether any changes found are sustainable in the long term. Three forms of data gathering are used, lesson observation, in-depth interviews, and email correspondence, in order to compare and capture the fluidity of changes over time. Results indicate that the teachers' fundamental belief in certain concepts of teaching and learning did indeed change, but ultimately certain teaching practices could not be altered in the teachers' home country due to the reality of its assumptions about teaching.

Yang, Yan, & Montgomery, Diane. (2013). Gaps or bridges in multicultural teacher education: A Q study of attitudes toward student diversity. *Teaching and Teacher Education*, 30(0), 27-37.

This paper highlights Q methodology as an appropriate research technique for capturing attitudes and demonstrates the use of Q method to study the attitudes of preservice teachers and teacher educators toward student diversity. A total of 43 participants from a comprehensive American university sorted 47 Q-statements. Two array groups emerged that indicate both consensual and divided attitudes toward student diversity. The study results indicate opportunities for both preservice teachers and teacher educators to find and create bridges to understand gaps in attitudes toward student diversity, which may help improve the effectiveness of multicultural teacher education.

Berry, Amanda, & Van Driel, Jan H. (2013). Teaching About Teaching Science: Aims, Strategies, and Backgrounds of Science Teacher Educators. *Journal of Teacher Education*, 64(2), 117-128.

Abstract:

Despite pressing concerns about the need to prepare high-quality teachers and the central role of teacher educators (TEs) in this process, little is known about how TEs teach about teaching specific subject matter, and how they develop their expertise. This empirical study focuses on the specific expertise that science TEs bring into teacher education. Individual interviews and story lines were conducted with 12 experienced science TEs from four different teacher education institutions in Australia and the Netherlands, to gain insight into their aims for teaching about science teaching, and how their expertise has developed on the basis of their professional background and experiences. The findings of this exploratory study reveal similarities among the concerns of these TEs and yet considerable diversity among their approaches. The study aims to contribute to a better understanding of science TEs' work and the development of a pedagogy of science teacher education.

Summary prepared by Claudia Cameratti-Baeza

Background

Berry and Van Driel investigated: (1) “what are science teacher educators’ concerns and main purposes when preparing PSTs to teach secondary science?” (2) “what do science teacher educators’ emphasize in their approach to teaching about teaching secondary science?,” and, (3) “How do teacher educators’ prior professional and personal experiences shape their purposes and approaches to teaching about teaching secondary science?” (123-124).

This descriptive study is rooted in the recognition that despite the essential role that TEs play in the preparation of teachers, little is known about the way they develop their expertise to teach a particular subject matter. Moreover, the authors pointed out the lack of an organized and formal way to prepare TEs to do their work. According to the authors, existing research on TEs focuses on three areas: (a) competencies that might be used to define the expertise of TEs, (b) the transition experiences of TEs into the academy, and (c) research conducted by TEs themselves, using their own professional contexts as research sites.

The authors note that in the context of science teacher education, demands for education that promotes students’ conceptual understanding and engagement generate challenges for TEs regarding the way they support preservice teachers’ (PSTs) learning and reflection on their practice. The authors assert that research on science TEs is also scarce. In naming a few exceptions the authors highlighted the work Smith (2000)², who described three kinds of pedagogical content knowledge (PCK) she developed as an elementary science TE: knowledge of (1) PSTs’ backgrounds as science learners, (2) PSTs’ ideas about science and scientists, and (3) PSTs’ views of learning to teach science.

The Study

The study focuses on the specific expertise that science TEs bring to secondary science method courses. Berry and Van Driel aim to contribute to a better understanding of the goals of science TEs, and how their expertise develops. The work focuses on three research questions:

RQ 1: What are science TEs’ concerns and main purposes when preparing PSTs to teach secondary science?

² Smith, D. C. (2000). Content and pedagogical content knowledge for elementary science teacher educators: Knowing our students. *Journal of Science Teacher Education*, 11, 27-46.

RQ 2: What do science TEs emphasize in their approaches to teaching about teaching secondary science?

RQ 3: How do science TEs' prior personal and professional experiences shape their purposes and approaches to teaching about teaching secondary science?

Data collection was centered on understanding experienced science TEs' approaches to teaching PSTs, and why they chose to provide PSTs with specific experiences. In addition, these TEs were invited to talk about their personal and professional experiences, how these led them to become TEs, and how these shaped their purposes and practice. The methods used to collect data were a two-part interview focused on (a) factors influencing career decisions and (b) TEs' pedagogical choices – the activities and assessments they designed to prepare PSTs to teach a specific topic. At the end of the interview, a second source of data considered the use of a storyline protocol, which asked TEs to draw and then explain a story line on how their satisfaction as a science TE had developed over time, and which experiences had influenced this development.

A sample of twelve TEs from four teacher education institutions, two from Australia and two from the Netherlands, was selected considering the following criteria: science discipline, years of teaching experience, background in teacher education, qualifications, and institutions. Table 1 (copied from the source) presents a summary of the characteristics of the sample.

Table 1. Some Characteristics of the Participating Science Teacher Educators

Code	Discipline	Research experience	Experience and background
N1	Biology	PhD in education	2 years SE, 9 years in national assessment center, 10 years TE
N2	Biology		10 years SE, 2 years TE
N3	Physics	PhD in physics	Teaching in Africa and Philippines, 5 years SE and 4 years TE in the Netherlands
N4	Chemistry	PhD in education	6 years SE in the Netherlands and 2 years SE in Zimbabwe, 7 years TE in Zimbabwe and 18 years TE in the Netherlands
N5	Biology	PhD in education	7 years research (science and education), 3 years SE, 10 years TE
N6	Biology		20 years SE, 10 years TE
N7	Chemistry		13 years SE, 10 years TE (in two institutes)
A1	Chemistry	PhD in education	9 years SE, 21 years TE
A2	Chemistry		38 years SE, 6 years TE
A3	Physics	PhD in physics	5 years in research, 3 years SE, 2 years TE
A4	Physics		26 years SE, 11 years TE
A5	General science	Working on a PhD in education	15 years SE, 10 years TE

Note: N = the Netherlands; SE = secondary education; TE = teacher education; A = Australia.

Data analysis was conducted considering an interpretative phenomenological perspective, without a priori system of codes. After an agreement about the salient features of each individual TE's account, the authors created individual summaries of the concerns, purposes and approaches, and relations of each of these to TEs' personal professional backgrounds. These individual summaries were then compared with the aim of identifying commonalities and differences across TEs, using a cross-case analysis.

Results

The TEs described a common concern about the general quality of science teaching in schools, emphasizing the idea that typically science education fails to promote meaningful learning of science concepts and to inspire students' interest in learning about science. They also shared a concern about the limited influence and the few opportunities they have to affect how PSTs teach in practice. They reflected about the absence of a strong connection between what PSTs experience in teacher education programs and what they experience when they enter the "real world" of practice.

These concerns allow the authors to distinguish three different purposes among the TEs in the study (responding to RQ1). These purposes are connected with the different emphases that

these TEs make in their approaches to teaching science teaching (addressing RQ2). To facilitate understanding I summarize these results in Table 2:

Table 2: Purposes and emphases in approaches for teaching science teaching by TEs in the sample

Purposes	1: Encourage PSTs to focus on teaching for conceptual understanding	2: Help PSTs develop motivating teaching strategies and curricula, mainly to engage students and make science more relevant to their lives	3: Promote a critical, questioning attitude among PSTs, and broaden their scope beyond the existing, traditional science curriculum and ways of teaching
Emphases in approaches to teaching	<p>The need for PSTs to be aware of the ways in which their students learn science, their misconceptions about what is being taught, or failure to grasp scientific concepts.</p> <p>In particular:</p> <ul style="list-style-type: none"> • The role of students' prior knowledge • The role of language in science in contrast with everyday discourse <p>The role of PSTs' own subject-matter knowledge.</p>	<p>The need for PSTs to teach science in ways that are more motivating and innovative in comparison with the ways in which science is traditionally taught.</p> <p>The need for PSTs to develop their own styles and strategies, and not copy or imitate those of other teachers (including their TEs).</p>	<p>To enable PSTs to be critical users of the curriculum they are to teach.</p> <p>Focus on the cultural views inherent (but frequently implicit) in traditional science curricula, and how they try to familiarize PSTs with, and challenge, these views.</p>

Finally, regarding RQ 3, the authors noted how each TE in the sample had a different, personal story about how he or she had entered teacher education. Yet, none of the TEs in the sample had planned a career as a TE – instead they had become “accidental” TEs. These prior experiences seemed much more influential in their approach to teaching than institutional features. For example, those TEs with and without a background in research described an approach much more oriented to practice, even considering themselves as “performers” until the time when they were engaged in research teams. TEs also reported that they learned and developed their roles through their own experiences as students in teacher education programs.

Discussion and conclusions

The authors noted an important common concern related to stimulating PSTs to implement innovative practices of science teaching, oriented to making science more comprehensible and more attractive to school students. This focus seems to foreground a tension with current practice in schools that seems to encourage PSTs to adopt traditional and didactic teaching strategies. Unfortunately, TEs describe a feeling of being powerless as far as their contribution to how PSTs teach in practice.



Another conclusion of this study is that the differences between the institutions and (national) contexts in this study were not strongly evident. In this regard, individual differences between TEs, even within one institute, were much larger than differences between institutions. The study thus suggests that TEs' personal background and individual career paths played out quite differently in their pedagogy of teacher education. The apparent lack of a structure to help TEs develop their expertise and practice could be another factor in this difference.

Ultimately, these findings might serve to stimulate dialogue between TEs within their institutions to see what they recognize about their own purposes and approaches that may form steps toward more common approaches, or contribute to the construction of a language to describe TEs' practices.

Summary:

Kleickmann, Thilo, Richter, Dirk, Kunter, Mareike, Elsner, Jürgen, Besser, Michael, Krauss, Stefan, & Baumert, Jürgen. (2013). Teachers' Content Knowledge and Pedagogical Content Knowledge: The Role of Structural Differences in Teacher Education. *Journal of Teacher Education*, 64(1), 90-106.

Abstract:

Pedagogical content knowledge (PCK) and content knowledge (CK) are key components of teacher competence that affect student progress. However, little is known about how teacher education affects the development of CK and PCK. To address this question, our research group constructed tests to directly assess mathematics teachers' CK and PCK. Based on these tests, we compared the PCK and CK of four groups of mathematics teachers at different points in their teaching careers in Germany. Confirmatory factor analyses showed that PCK and CK measurement was satisfactorily invariant across the teacher populations considered. As expected, the largest differences in CK and PCK were found between the beginning and the end of initial teacher education. Differences in the structures of teacher education were reasonably well reflected in participants' CK and PCK.

Summary prepared by Simona Goldin

Research question:

Kleickmann et al investigated: "How teachers' knowledge of subject matter – [content knowledge] CK and [pedagogical content knowledge] PCK – differs across the three phases of teacher education in Germany: from the beginning to the end of university studies... to the end of the induction period, and finally during inservice training" (94). The authors sought to test teacher knowledge proximally by means of "knowledge tests."

Literature review:

Kleickmann et al. review research from the 1980s to the present, starting with Shulman (1986, 1987) and the body of research that built upon his ideas about the "content-specific characteristics of teachers and of instruction." They note that researchers define CK and PCK differently, but argue that there are important points of consensus as well, such as: (1) CK represents teachers' understanding of subject matter, (2) pedagogical content knowledge – what teachers need to know in order to make subject matter accessible to students. PCK might include teachers' knowledge of students' subject-specific conceptions and misconceptions, as well as subject-specific strategies and representations.

Kleickmann et al. refer to Grossman's argument that teachers gain knowledge for teaching from three distinct sources: (1) teachers' own K-12 learning, (2) teacher education and professional development, and (3) teaching experiences (summarized in Freidrichsen et al. 2009). Building on this, they argue that there are important formal and informal opportunities to learn PCK and CK in teachers' pre-training and the inservice phases of learning to teach.

After establishing the importance of teachers' knowledge of subject matter, the authors posit that there is little research uncovering how learning opportunities (from pre-training through professional development) support the development of teachers' subject-specific knowledge. The authors briefly categorize and summarize research that addresses this question, and write that research illuminates the connection between formal learning opportunities and the development of PCK and CK, but that there are important remaining questions. The authors assert that *how* teacher education supports teachers' subject-matter knowledge is crucial to educational reform.

Setting and Methods

The setting for this research is the German teacher education system, which has the following two qualities that make it useful for study of this question: (1) there are two phases of learning to teach – the university- and the classroom-induction phase, and (2) preservice teachers are prepared separately according to whether they will teach in academic track or nonacademic track schools. The authors made a few important distinctions between the U.S. and German systems of TE, including the point that all intending teachers graduate with the First and Second State Examinations, which serves to “highly standardize” the curriculum for TE across universities and states.

The researchers used paper-and-pencil tests to assess intending teachers’ mathematical CK and PCK. The 23-item test focused on geometry, algebra, arithmetic, and functions, and was “designed to assess conceptual understanding of the contents of the secondary-level mathematics curriculum and require complex mathematical argumentation of proofs” (95). Intending teachers’ knowledge of students, instruction, and tasks were assessed on the PCK test, which the authors wrote overlap with Ball et al.’s MKT framework (2008). The authors piloted the use of these tests, which “provided evidence for the criterion validity of the CK and the PCK tests: Both were shown to produce measures that were substantially related to teachers’ instructional practice and student achievement gains” (96).

Kleickmann et al. analyzed cross-sectional data from four samples of German pre- and inservice mathematics teachers. The samples were all drawn from the Cognitive Activation in the Classroom research program conducted at the Max Planck Institute for Human Development in Berlin. Samples included 243 mathematics teacher candidates recruited from universities in four cities (first and fifth semester), 539 preservice mathematics teachers in their second (final) year of the induction phase, and 198 German mathematics teachers. They controlled for the differences in the samples (gender, school track, high school GPA, cognitive abilities, enrollment in advanced mathematics course at upper secondary level, and interest in mathematics) when computing differences in teachers’ knowledge of subject matter.

The authors note that intending teachers in the academic track study for nine semesters, and their work focuses on CK, while intending teachers in the non-academic track study for seven semesters, and their work focuses on PCK and pedagogy. Thus, intending teachers in the academic track have “up to twice as many learning opportunities for the development of CK” as those in the non-academic track. Meanwhile, they write that the second phase of teacher education, which they refer to as the “practical” phase, offers many opportunities for the development of PCK, but little “formal” learning opportunities for CK. During this phase intending teachers spend an average of 3.5-4 days per week in schools. The remaining time is spent in TE program classrooms.

Summary/conclusions

Key findings include:

1. “The first phase of teacher education seems to play a particularly important role in the development of CK” (100).
2. “The results indicate strong differential development of CK during initial teacher education. Future academic-track teachers showed higher increases in CK from Year 1 to Year 3 of university education as well as from Year 3 to the induction phase than did future nonacademic-track teachers. At the end of teacher education, the differences between teachers of the academic and nonacademic tracks were particularly large” (100).
3. The authors did not find evidence that the inservice phase of TE contributed in significant ways to teachers’ development of mathematical CK.
4. “The first and the second phases of teacher education seem to play an important role in the development of PCK. In contrast to the findings for CK, academic-and nonacademic-track teachers did not differ greatly in terms of differences in PCK scores from Year 1 to Year 3 of university education or from Year 3 to the induction phase” (100).

5. In contrast to the above finding, inservice academic track teachers' knowledge of PCK did increase. Thus, "in this group of teachers, the inservice phase seems to contribute to the further, but quite weak, development of PCK after initial teacher education" (100). The authors hypothesize that this is confirmation of the importance of CK in the development of PCK – "higher CK may lead to increased uptake of learning opportunities to acquire PCK" (100).
6. One of the authors' central hypotheses was confirmed – namely, "formal and nonformal learning opportunities are especially conducive to the development of CK and PCK, and that teaching experience alone is insufficient" (100). The authors found support for this hypothesis in their finding that academic-track teachers had significantly greater opportunities to learn mathematical CK and more gains in mathematical CK than did nonacademic track teachers.
7. The inservice phase, meanwhile, "does not seem to foster the development of CK and PCK as strongly as the formal and nonformal learning opportunities provided by initial teacher education" (100). This has important implications for professional development. In particular, the authors argue that professional development has the greatest chance of supporting teachers' developments of mathematical CK and PCK is: long-term, coherent, and involves teachers in "active learning." The authors are quick to note that these are not often characteristics of modal professional development in either Germany or the U.S.

Table A1. Regression Models Predicting CK and PCK Scores

Independent variables	CK		PCK	
	M1	M2	M3	M4
	$\hat{\beta}$	$\hat{\beta}$	$\hat{\beta}$	$\hat{\beta}$
Constant	466.54**	480.55**	371.96**	380.63**
Year 1 students	-26.84**	-21.27**	-66.94**	-63.96**
Year 3 students	-17.56**	-4.57	-47.79**	-35.09**
Student teachers	10.93**	10.14**	-13.32**	-12.82**
Gender		-21.74**		-18.62**
School track		7.37		13.72*
School track × Year 1 students		-23.91**		-5.06
School track × Year 3 students		-13.23**		-5.83
School track × student teachers		-9.75**		-6.77*
GPA		-16.16**		-13.12**
Cognitive abilities		4.55**		7.47**
Advanced mathematics course		12.67**		15.58**
Interest in mathematics		15.35**		13.75**
R ²	.07	.46	.18	.45

Note: CK = content knowledge; PCK = pedagogical content knowledge; GPA = grade point average. M1 and M3 are the initial models, including the group variables only; M2 and M4 are the full models, including all covariates.

*p < .05 (two-tailed). **p < .01 (two-tailed).

*** The above table taken from Kleickmann et al., p. 103.

The authors note significant issues of equity in the allocation of teachers in Germany. In particular, they find that there are considerable differences in the CK and PCK of academic-track and nonacademic-track teachers, and that students in nonacademic tracks "differ from their peers in the academic track not only in their ability and achievement but also in their social and ethnic backgrounds." Consequently, low-achieving students from families with lower socioeconomic status and immigrant families tend to be taught by teachers who are less competent in terms of CK and PCK.

When detailing limitations, the authors note that while they investigated differences in quantity of opportunities to learn, they did not study differences in the quality of those opportunities.