edTPA

SCALE
Stanford Center for Assessment, Learning, & Equity

Review of Research on Teacher Education: edTPA Task Dimensions and Rubric Constructs

Version 2
July 2015

edTPA

SCALE
Stanford Center for Assessment, Learning, & Equity

Review of Research on Teacher Education: edTPA Task Dimensions and Rubric Constructs

Introduction

This document presents the research literature that informs the development of edTPA and its rationale as a performance-based assessment for preservice teacher candidates' readiness to teach. The literature cited provides a foundation for the common edTPA architecture used across 27 subject-specific licensure/certification areas and the fifteen shared rubric constructs that define effective teaching (Smith, Baker, Hattie, & Bond, 2008). The bibliography supports the validity arguments demonstrated through content validation, job analysis studies, and factor analyses conducted during edTPA pilots and field testing (see the edTPA 2013 Summary Report referenced below).

Smith, T., W., Baker, W., Hattie, J., & Bond, L. (2008). A validity study of the certification system of the National Board for Professional Teaching Standards. In L. C. Ingvarson and J. Hattie (Eds.), Assessing teachers for professional certification: The first decade of the National Board for Professional Teaching Standards (pp. 345–380). Amsterdam, the Netherlands: Elsevier Press.

Stanford Center for Assessment, Learning and Equity. (2013). 2013 edTPA Field Test: Summary Report. Stanford, CA: Author. Retrieved from https://secure.aacte.org/apps/rl/res_get.php?fid=827&ref=edtpa

The following literature review was conducted by SCALE staff, with input from educators and researchers, to identify foundational research and recent studies relevant for each rubric. Widely used online databases were reviewed to select articles, chapters, and texts that represent the range of research upon which each rubric is based. These databases include:

- JSTOR, a digital library of academic journals, books, and primary sources, with full- text searches of almost 2,000 journals;
- *ERIC* (Educational Resources Information Center), an online library of education research and information, sponsored by the Institute of Education Sciences (IES) of the U.S. Department of Education;
- *PsycINFO,* from the American Psychological Association, which includes 3.7 million citations of peer-reviewed journals, books, dissertations in psychology and behavioral sciences; and
- Google Scholar, a web site providing peer-reviewed papers, theses, books, abstracts, and articles from academic publishers.
- Communication with researchers, experts and faculty in the field of teacher preparation.

The Stanford University library was used to access books as well as online catalogs of electronic collections of journals and publications.

© 2015 Stanford Center for Assessment, Learning and Equity

Inclusion criteria includes foundational texts in the field relevant to the rubric or section, studies that provide an empirical examination of the construct, reviews that summarize the state of the evidence in that field, and papers, chapters, or books that make research-based recommendations for practice. Effort was made to include articles and publications that speak to crosscutting concepts addressed by each rubric; research within specific subject fields or populations was included when possible to demonstrate the application of the broader constructs in a multitude of fields and across a range of diverse learners. An abstract follows all articles and texts for which one was available; when an abstract was not available, only the citation is included. For several texts, a particular chapter is cited when that chapter most closely aligns with the construct being addressed. When the relevant construct is addressed throughout a publication or in several chapters, the text is cited in its entirety. Constructs measured by the rubrics are often related and have a shared foundation; each citation is included under all rubrics for which it is relevant and may therefore appear more than once in the review.

The first section of the review presents relevant literature and research that speak to the role of assessment in teacher education and student learning. Following this section, the presentation of the bibliography follows the organization of the edTPA handbooks, and references are organized according to the three common tasks (Planning, Instruction, Assessment), rubrics by number within each task, and alphabetically by author for each rubric. Each rubric is labeled by number, and includes the guiding question and rubric concept aligned to the construct as it is assessed for the majority of the fields. Guiding questions and rubric concepts are phrased generically for the purposes of this review. See edTPA handbooks for subject-specific rubric language.

The review of the research provided here is not meant to be exhaustive – rather it is intended to inform the design principles of, and foundation for, the common architecture of edTPA as a representation of effective teaching, and the underlying constructs evaluated by the fifteen rubrics. It is intended to support the construct validity of edTPA as well as to further assist programs and candidates in their use of the assessment and their thinking about the underlying concepts.

© 2015 Stanford Center for Assessment, Learning and Equity

Relevant Research on Assessment of Readiness to Teach

Adkins, A., Klass, P., & Palmer, E. (2015). Identifying demographic and preservice teacher performance predictors of success on the edTPA. Paper Presented at the 2015 Hawaii International Conference on Education. Honolulu, Hawaii.

Illinois has adopted the edTPA, "the first nationally available, educator-designed performance assessment for new teachers entering the profession" (SCALE, 2013, p. 4) as the summative assessment for all graduating teacher education majors starting in fall 2015. Illinois State University, graduating one in eight teachers in the state, has been piloting the edTPA with its current students for the past two years to help teacher education programs assess how well their courses and experiences prepare students for the test before it comes into effect. Through stratified random sampling by program, over 600 teacher education majors were selected to take the edTPA. This study combined demographic, class performance, program, and edTPA measures for these students to examine relationships between and among these variables across multiple disciplines. The purpose of this correlation study was to understand the interrelationships among the state teaching tests and student performance measures as well as to identify predictors of teaching performance that may be useful to Illinois State and the field as more states use this test as a crucial gateway to the teaching profession. Based on the findings that student academic achievement in classes and in student teaching is related to success on state teacher tests, including the new edTPA, one can conclude that student achievement in overall coursework has a small positive relationship to the key concepts and skills the state and profession regard as crucial components in their assessments. The passage rate on the tests at this point is high, but continued focus is necessary as cutoff scores will increase for several years. Last, to complement large-scale studies, more program-specific research should be conducted to assist with advising, planning, and developing curriculum in the various teacher education disciplines.

Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of teacher education*, *60*(5), 497-511.

In this article, the authors argue for making practice the core of teachers' professional preparation. They set the argument for teaching practice against the contemporary backdrop of a teacher education curriculum that is often centered not on the tasks and activities of teaching but on beliefs and knowledge, on orientations and commitments, and a policy environment preoccupied with recruitment and retention. The authors caution that the bias against detailed professional training that often pervades common views of teaching as idiosyncratic and independently creative impedes the improvement of teachers' preparation for the work of teaching. They offer examples of what might be involved in teaching practice and conclude with a discussion of challenges of and resources for the enterprise.

© 2015 Stanford Center for Assessment, Learning and Equity

Benner, S.M. & Wishart, B. (2015). Teacher preparation program impact on student learning: Correlations between edTPA, and VAM levels of effectiveness. Paper presented at the 2015 annual meeting of the meeting of the American Educational Research Association, Chicago, IL.

Bond, L., Smith, T. W., Baker, W. K., & Hattie, J.A. (2000). *The certification system of the National Board for Professional Teaching Standards: A construct and consequential validity study*. Greensboro, NC: Center for Educational Research and Evaluation.

This article describes a construct validation study of the National Board for Professional Teaching Standards' system of advanced certification. The evidence analyzed in the study included teachers' instructional objectives and lesson plans for a given instructional unit, data collected during visits to all 65 teachers' classrooms, and transcripts of scripted interviews of the teachers and their students. Two validity questions were examined in this comparative study: (a) To what extent is the National Board's vision of accomplished practice, as laid down in its Standards documents and as instantiated in its assessments, consonant with the characteristics of teaching expertise that have emerged from the research and scholarly literature?, and (b) Can National Board Certified teachers (NBCTs) and their noncertified counterparts (non-NBCTs) be distinguished on the basis of the quality of work produced by their students? In every comparison between NBCTs and non-NBCTs on the dimensions of teaching excellence, NBCTs obtained higher mean scores. In 11 of the 13 comparisons, the differences were highly statistically significant.

Cantrell, S., & Kane, T. J. (2013). *Ensuring fair and reliable measures of effective teaching: Culminating findings from the MET project's three-year study*. Seattle, WA: Bill & Melinda Gates Foundation. Available from http://www.metproject.org/downloads/MET_Ensuring_Fair_and_Reliable_Measures_Practitioner_Brief.pdf

Cavalluzzo, L., Barrow, L., Mokher, C., Geraghty, T., & Sartain, L. (2014). From Large Urban to Small Rural Schools: An empirical study of National Board certification and teaching effectiveness. Alexandria, VA: The CNA Corporation. Retrieved from http://www.cna.org/sites/default/files/research/IRM-2015-U 010313.pdf.

Chung, R. R. (2008). Beyond assessment: Performance assessments in teacher education. *Teacher Education Quarterly*, *35*(1), 8-28.

Over the last decade, teacher performance assessments (TPAs) have begun to find appeal in the context of teacher education programs and teacher licensing for their innovative ways of assessing teacher knowledge and skills but primarily for their potential to promote teacher learning and reflective teaching. Studies of preservice teachers who have completed a TPA, portfolio assessments in particular, have examined learning outcomes for teachers and have generally found

© 2015 Stanford Center for Assessment, Learning and Equity

positive effects on their learning (Anderson & DeMeulle, 1998; Lyons, 1996, 1998a, 1998b, 1999; Snyder, Lippincott, & Bower, 1998; Stone, 1998; Whitford, Ruscoe, & Fickel, 2000).

Chung Wei, R., & Pecheone, R. L. (2010). Assessment for learning in preservice teacher education: Performance-based assessments. In M. Kennedy (Ed.), *Teacher assessment and the quest for teacher quality: A handbook* (pp. 69-132). San Francisco, CA: John Wiley & Sons.

Cochran-Smith, M. (2001). The outcomes question in teacher education. *Teaching and Teacher Education*, *17*(5), 527-546. doi:10.1016/S0742-051X(01)00012-9

This article begins with the premise that it is possible to trace teacher education development and reform in terms of the major questions that have driven the field and the sometimes competing ways these questions have been constructed, debated, and enacted in research, policy, and practice. The author argues that currently "the outcomes question" is driving teacher education. Generally, the outcomes question includes debates about what impacts teacher education should be expected to have on teacher learning, professional practice, and student learning as well as debates about how, by whom, and for what purposes outcomes should be documented, demonstrated, and/or measured. The article identifies three major ways that the outcomes question in teacher education is being constructed in the research literature, the policy arena, and the media: outcomes as long term impact, outcomes as teacher test scores, and outcomes as professional performance. Each of these is analyzed in some detail, drawing on related analyses from policy and teacher education practice. Finally the article suggests several concerns about how the outcomes question is being constructed in teacher education, questioning some of the viewpoints that are being legitimized or undermined and drawing particular attention to the impact of these for a just and democratic society.

Cochran-Smith, M., & Zeichner, K. M. (Eds.). (2005). *Studying teacher education: The report of the AERA Panel on Research and Teacher Education*. Mahwah, NJ: Erlbaum.

Cowan, J., & Goldhaber, D. (2014). *Assessing the relationship between teacher performance on Washington state's ProTeach Portfolio and student test performance* (CEDR Working Paper 2014-2). Seattle, WA: University of Washington. Retrieved on January 13, 2015 from http://www.cedr.us/papers/working/CEDR%20WP%202014-2.pdf

Cowan, J., & Goldhaber, D. (2015). National Board Certification and Teacher Effectiveness: Evidence from Washington. Technical Report 2015-1, Center for Education Data and Research, Seattle, WA. Retrieved from http://www.cedr.us/papers/working/CEDR%20WP%2020153_NBPTS%20Cert.pdf.

© 2015 Stanford Center for Assessment, Learning and Equity

Darling-Hammond, L. (2010). *Evaluating teacher effectiveness: How teacher performance assessments can measure and improve teaching*. Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2010/10/pdf/teacher_effectiveness.pdf

Parents, practitioners, and policymakers agree that the key to improving public education in America is placing highly skilled and effective teachers in all classrooms. Yet the nation still lacks a practical set of standards and assessments that can guarantee that teachers, particularly new teachers, are well prepared and ready to teach. This report discusses a promising approach to the question of how to measure teacher effectiveness. Specifically, it describes the ways in which assessments of teacher performance for licensing and certification can both reflect and predict teachers' success with children so that they can not only inform personnel decisions, but also leverage improvements in preparation, mentoring, and professional development. It outlines progress in the field of teacher assessment development and discusses policies that could create much greater leverage on the quality of teacher preparation and teaching than has previously existed in the United States.

Darling-Hammond, L., Newton, S. P., & Wei, R. C. (2013). Developing and assessing beginning teacher effectiveness: The potential of performance assessments. *Educational Assessment, Evaluation and Accountability*, *25*(3), 179-204. doi: 10.1007/s11092-013-9163-0

The Performance Assessment for California Teachers (PACT) is an authentic tool for evaluating prospective teachers by examining their abilities to plan, teach, assess, and reflect on instruction in actual classroom practice. The PACT seeks both to measure and develop teacher effectiveness, and this study of its predictive and consequential validity provides information on how well it achieves these goals. The research finds that teacher candidates' PACT scores are significant predictors of their later teaching effectiveness as measured by their students' achievement gains in both English language arts (ELA) and mathematics. Several subscales of the PACT are also influential in predicting later effectiveness: These include planning, assessment, and academic language development in ELA, and assessment and reflection in mathematics. In addition, large majorities of PACT candidates report that they acquired additional knowledge and skills for teaching by virtue of completing the assessment. Candidates' feelings that they learned from the assessment were the strongest when they also felt well supported by their program in learning to teach and in completing the assessment process.

Diez, M. E. (2001). Assessing student competence in teacher education programs. In C.A. Palomba & T.W. Banta (Eds.), *Assessing student competence in accredited disciplines: Pioneering approaches to assessment in higher education* (pp. 29-48). Sterling, VA: Stylus.

© 2015 Stanford Center for Assessment, Learning and Equity

Diez, M. E. (2010). It is complicated: Unpacking the flow of teacher education's impact on student learning. *Journal of Teacher Education*, *61*(5), 441-450. doi: 10.1177/0022487110372927

Knowing that a teacher education program's graduates affected P-12 student learning may be important, but knowing how the program prepared their graduates to affect learning is critical for ongoing reform efforts. In this essay, the author argues for the utility of looking at three sets of relationships involved in gauging the impact of teacher education programs on P-12 student learning—teacher education program impact on teacher candidate learning, teacher graduate practice of teacher education program outcomes in P-12 settings, and teacher graduate impact on P-12 pupil learning. The author also addresses three issues affecting the efficacy of reform efforts—a focus on proving versus improving, an absence of assessment literacy, and the need for teaching to support learning.

Duckor, B., Castellano, K. E., Tellez, K., Wihardini, D., & Wilson, M. (2014). Examining the internal structure evidence for the Performance Assessment for California Teachers: A validation study of the Elementary Literacy Teaching Event for Tier I teacher licensure. *Journal of Teacher Education*, *65*(5), 402-420. http://doi.org/10.1177/0022487114542517

Interpretations for licensure tests involve a series of inferences or a validity argument, leading from the test score to decisions about who is accepted or denied entry into a profession. Utilizing an argument-based framework for validation based on the Standards for Educational and Psychological Testing, we explore the evidence for the ongoing use of the Performance Assessment for California Teachers (PACT) for Tier I licensure decisions. The evidence for a unidimensional and a multidimensional structure based on the instrument's content are examined with an item response model. Examining operational data (n = 1,711) from seven California teacher education institutions, we found sufficient internal structure validity evidence to support the continued, but limited, use of this instrument for its intended summative purpose. Evidence for a three-dimensional structure of model fit better explains overall teacher candidate performance on the PACT instrument as it is currently designed.

Forzani, F. M. (2014). Understanding "Core Practices" and "Practice-Based" Teacher Education: Learning From the Past. *Journal of Teacher Education*, *65*(4), 357-368.

In recent years, a small but growing strand of research has investigated ways of focusing teachers' professional education on "core" or "high leverage" practices of teaching. These efforts are easily conflated with other initiatives to develop "practice-focused" teacher education, raising questions about what these terms even mean. This article investigates what can be learned by comparing and contrasting teacher education focused on core practices with other approaches that might also

© 2015 Stanford Center for Assessment, Learning and Equity

be called "practice-based," including those dating back to the 19th century. It focuses on three important periods in the history of teacher education: the heyday of the normal schools in the late 1800s, the period of scientific efficiency in the 1920s and 1930s, and the era of competency-based teacher education in the 1960s and 1970s.

Gitomer, D. H. (Ed.). (2009). *Measurement issues and assessment for teaching quality*. Thousand Oaks, CA: SAGE Publications.

Goldhaber, D., & Anthony, E. (2007). Can teacher quality be effectively assessed? National Board certification as a signal of effective teaching. *The Review of Economics and Statistics*, *89*(1), 134-150. www.mitpressjournals.org/doi/pdf/10.1162/rest.89.1.134

In this paper, we describe the results of a study assessing the relationship between the certification of teachers by the National Board for Professional Teaching Standards (NBPTS) and elementary-level student achievement. We examine whether NBPTS assesses the most effective applicants, whether certification by NBPTS serves as a signal of teacher quality, and whether completing the NBPTS assessment process serves as a catalyst for increasing teacher effectiveness. We find consistent evidence that NBPTS is identifying the more effective teacher applicants and that National Board Certified Teachers are generally more effective than teachers who never applied to the program. The statistical significance and magnitude of the "NBPTS effect," however, differs significantly by grade level and student type. We do not find evidence that the NBPTS certification process itself does anything to increase teacher effectiveness.

Haertel, E. H. (1987). Toward a National Board of Teaching Standards: The Stanford Teacher Assessment Project. *Educational Measurement: Issues and Practice*, *6*(1), 23-24. doi: 10.1111/j.1745-3992.1987.tb00396.x

Haertel, E. H. (1991). New forms of teacher assessment. *Review of Research in Education*, *17*(1), 3-29. doi: 10.3102/0091732X017001003

Hollins, E. R. (Ed.). (2015). *Rethinking Field Experiences in Preservice Teacher Preparation: Meeting New Challenges for Accountability*. Routledge.

Lin, S. (2015) Learning through Action: Teacher Candidates and Performance Assessments. Doctoral dissertation, University of Washington, Seattle, WA.

Performance assessments such as the Teacher Performance Assessment (edTPA) are used by state departments of education as one measure of competency to grant teaching certification. Although the edTPA is used as a summative assessment, research studies in other forms of

© 2015 Stanford Center for Assessment, Learning and Equity

performance assessments, such as the Performance Assessment for California Teachers (PACT) and the National Board Certification for Professional Teaching Standards (NBCPT) have shown that they can be used as learning tools for both preservice and experienced teachers and as a form of feedback for teacher education programs. The present study investigated the ways in which the edTPA functioned as an opportunity to learn in one elementary teacher education program. Data were collected through seven teacher candidate case studies, two focus groups, and one cohort survey. The findings indicated that there are opportunities for candidates to develop their practice through the edTPA experience. There are variations in the extent to which candidates take up these opportunities to learn. Finally, the learning opportunities are likely affected by the personal characteristics of the candidates and by the nature of interactions and collaborations they have with others in the context of their participation in the edTPA process.

Pecheone, R. L., & Chung, R. R. (2006). Evidence in teacher education: The Performance Assessment for California Teachers (PACT). ***Journal of Teacher Education*****,** ***57*****(1), 22-36 doi: 10.1177/0022487105284045**

The Performance Assessment for California Teachers (PACT) was developed in response to a California State mandate (SB 2042), requiring teacher preparation programs to use performance assessments as one measure in making credentialing decisions. In this article, results are examined from statewide implementation of the PACT assessments during the first 2 pilot years. Despite the limitation of only 2 years of data, 3 years of implementation experiences have informed participating programs about how they can better support candidate learning and identify areas for examination. In addition, this research suggests that the PACT performance assessment can be used in teacher education as a valid measure of individual teacher competence for the purpose of teacher licensure and as a powerful tool for teacher learning and program improvement.

Peck, C., Gallucci, C., & Sloan, T. (2010). Negotiating implementation of high-stakes performance assessment policies in teacher education: From compliance to inquiry. ***Journal of Teacher Education*****,** ***61*****(5), 451-463. doi: 10.1177/0022487109354520**

Teacher education programs in the United States face a variety of new accountability policies at both the federal and the state level. Many of these policies carry high-stakes implications for students and programs and involve some of the same challenges for implementation as they have in the P-12 arena. Serious dilemmas for teacher educators arise in these contexts, as compliance with prescriptive state mandates is often interpreted by faculty to signify a demoralizing loss of program autonomy and integrity, whereas noncompliance may result in loss of program accreditation. The authors describe how one teacher education program negotiated these dilemmas in a fashion responsive to local values and concerns while also meeting state requirements. Results are discussed in terms of tensions between (a) policy goals seeking

© 2015 Stanford Center for Assessment, Learning and Equity

alignment and coherence across institutions of higher education and (b) motivational conditions likely to engage faculty in the difficult work of programmatic renewal and change in teacher education.

Peck, C., Gallucci, C., Sloan, T., & Lippincott, A. (2009). Organizational learning and program renewal in teacher education: A socio-cultural theory of learning, innovation and change. *Educational Research Review, 4*, 16-25. doi:10.1016/j.edurev.2008.06.001

Pressures for change in the field of teacher education are escalating significantly as part of systemic education reform initiatives in a broad spectrum of economically developed and developing nations. Considering these pressures, it is surprising that relatively little theoretical or empirical analysis of learning and change processes within teacher education programs has been undertaken. In this paper, we illustrate some ways in which contemporary socio-cultural learning theory may be used as a lens for addressing these issues. Using a theoretical framework developed by Harré [Harré, R. (1984). *Personal being: A theory for individual psychology*. Cambridge, MA: Harvard University Press], we show how processes of individual and collective learning led to changes in a teacher education program observed over an eighteen month period of time. Important innovations in program practice were generally found to have their sources in the creative work of individual faculty. However program level changes required negotiation of new ideas and practices within small groups of faculty, and with the larger collective of the program. We conclude that the Harré model, and the socio-cultural learning theories from which it is derived, may offer a useful theoretical framework for interpreting complex social processes underlying organizational renewal, innovation, and change.

Peck, C., & McDonald, M. (2013). Creating "cultures of evidence" in teacher education: Context, policy and practice in three high data use programs. *The New Educator*, *9*(1), 12-28. doi: 10.1080/1547688X.2013.751312

One of the important rationales for the development and implementation of a rigorous classroom-based measure of preservice teacher quality is that such a tool will provide new sources of data that are highly relevant to the task of improving programs of teacher preparation. However, research on data utilization within organizations from a variety of disciplines makes it clear that even when relevant and useful data are available, they are often not used for decision making. We studied three "high-data-use" programs from among the 32 California institutions implementing the Performance Assessment for California Teachers (PACT) to identify organizational practices associated with the use of PACT data for program improvement. We describe practices within and across these programs that were identified by informants as important to their success in using teacher performance outcome data to make decisions about program renewal and improvement.

© 2015 Stanford Center for Assessment, Learning and Equity

Peck, C. A., Singer-Gabella, M., Sloan, T., & Lin, S. (2014). Driving blind: Why we need standardized performance assessment in teacher education. *Journal of Curriculum and Instruction*, *8*(1), 8-30. doi:10.3776/joci.2014.v8n1p8-30

In this article we argue that standardized teaching performance assessments (TPAs) offer a uniquely valuable resource for learning and improvement of practice in teacher education. The affordances of TPAs as opportunities for learning are identified at four levels, including those for teacher candidates, individual faculty, organizational learning at the program level, and organizational networks that span program boundaries. We conclude that TPAs can provide motivation and direction for continuous program improvement efforts, contribute to the development of a common and concrete language of practice, and accelerate the professionalization of teaching.

Sanders, W. L., & Horn, S. P. (1998). Research findings from the Tennessee Value-Added Assessment System (TVAAS) database: Implications for educational evaluation and research. *Journal of Personnel Evaluation in Education*, *12*(3), 247-256. doi: 10.1023/A:1008067210518

The Tennessee Value-Added Assessment System determines the effectiveness of school systems, schools, and teachers based on student academic growth over time. An integral part of TVAAS is a massive, longitudinally merged database linking students and student outcomes to the schools and systems in which they are enrolled and to the teachers to whom they are assigned as they transition from grade to grade. Research conducted utilizing data from the TVAAS database has shown that race, socioeconomic level, class size, and classroom heterogeneity are poor predictors of student academic growth. Rather, the effectiveness of the teacher is the major determinant of student academic progress. Teacher effects on student achievement have been found to be both additive and cumulative with little evidence that subsequent effective teachers can offset the effects of ineffective ones. For these reasons, a component linking teacher effectiveness to student outcomes is a necessary part of any effective educational evaluation system.

Sato, M. (2014). What is the underlying conception of teaching of the edTPA? Journal of Teacher Education, 65(5), 421-434.

The edTPA, a nationally available performance assessment for teacher candidates, has recently been developed and implemented in teacher education programs across the United States. Advocates make arguments for the need for such an assessment while critics of standardized performance assessments point out the dangers of standardization. This article takes a step back from the arguments in support of or in opposition to the assessment and asks fundamentally what the underlying conception of teaching of the edTPA is. After examining conceptions of teaching articulated by scholars such as Nathanial Gage, Larry Cuban, Lee Shulman, Paulo Freire, and bell hooks, this article argues that the underlying conception of teaching of the edTPA is one of

© 2015 Stanford Center for Assessment, Learning and Equity

professional practice, not only at the individual level but also at the level of teaching as a collective enterprise. The conception of teaching argument is also connected to discussions of the validity arguments for the edTPA with specific attention to face validity, content validity, and construct validity.

Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researcher*, 29(7), 4-14. doi: 10.2307/1176145

Sloan, T. (2013). Distributed leadership and organizational change: Implementation of a teaching performance measure. *The New Educator*, *9*, 29-53. doi: 10.1080/1547688X.2013.751313

This article explores leadership practice and change as evidenced in multiple data sources gathered during a self-study implementation of a teaching performance assessment. It offers promising models of distributed leadership and organizational change that can inform future program implementers and the field in general. Our experiences suggest that the role of program leaders was to manage key disturbances to the system, to organize activities that emerged from faculty inquiry, to support distributed leadership alignments, and to facilitate private work into the public space. Our data also suggest that distributed leadership among all program faculty was an important element in developing an inquiry versus compliance orientation to implementation.

Whittaker, A., & Nelson, C. (2013). Assessment with an "End in View". *The New Educator*, *9*(1), 77-93.

This article uses Dewey's (1938) concept of "end in view" to frame one California State University's purposeful action in implementing the Performance Assessment for California Teachers (PACT). The authors provide a chronology of events that reveal the ways in which teacher education faculty were engaged in examining PACT outcomes and candidate performance through informal, "mock scoring" events, and the design of formative, embedded signature assessments, and the resulting changes in the program assessment system, curriculum, and instructional practices. The article closes with concerns and suggestions for sustaining the "end in view" during high-stakes and low-budget circumstances.

Wilson, M., Hallam, P. J., Pecheone, R. L., & Moss, P. A. (2014). Evaluating the validity of portfolio assessments for licensure decisions. *Education Policy Analysis Archives*, *22*(6). http://dx.doi.org/10.14507/epaa.v22n6.2014

This study examines one part of a validity argument for portfolio assessments of teaching practice used as an indicator of teaching quality to inform a licensure decision. We investigate the relationship among portfolio assessment scores, a test of teacher knowledge (ETS's Praxis I and II), and changes in student achievement (on Touchstone's Degrees of Reading Power Test [DRP]). Key questions are the extent to which the assessment of teaching practice (a) predict gains in

© 2015 Stanford Center for Assessment, Learning and Equity

students' achievement and (b) contribute unique information to this prediction beyond what is contributed by the tests of teacher knowledge. The venue for our study is Connecticut State Department of Education's (CSDE) support and licensure system for beginning teachers, the Beginning Educator Support and Training (BEST) program (as it was implemented at the time of our study). We investigated whether elementary teachers' mean effects on their students' reading achievement support the use of BEST elementary literacy portfolio scores as a measure of teaching quality for licensure, using a data set gathered from both State and two urban school district sources. The HLM findings indicate that BEST portfolio scores do indeed distinguish among teachers who were more and less successful in enhancing their students' achievement. An additional analysis indicated that the BEST portfolios add information that is not contained in the Praxis tests, and are more powerful predictors of teachers' contributions to student achievement gains.

© 2015 Stanford Center for Assessment, Learning and Equity

Task 1: Planning

Rubric 1: Planning for Content Understandings

Guiding Question: *How do the candidate's plans build conceptual understanding?*

Rubric Concept: *Candidate's plans consistently align standards, objectives, instructional strategies and learning tasks to address concepts and subject-specific elements, including thinking skills, in a progression that builds understanding.*

Beyer, C. J., & Davis, E. A. (2012). Developing preservice elementary teachers' pedagogical design capacity for reform-based curriculum. *Curriculum Inquiry, 42*(3), 386-413. doi: 10.1111/j.1467-873X.2012.00599.x

Teachers use curriculum materials as a guide in their planning, critiquing and adapting them to address reform-based goals and practices and specific contextual needs. To become well- started beginners in planning lessons, novice teachers need opportunities to develop their pedagogical design capacity—that is, their ability to use personal and curricular resources in designing instruction for students. This study investigated the use of reform-based criteria in supporting 24 preservice teachers enrolled in an elementary science methods course. In learning about and applying criteria, the preservice teachers developed aspects of their pedagogical design capacity by expanding their analysis ideas and refining their knowledge and beliefs about curriculum design. However, many struggled with analyzing lesson plans in a reform-oriented way during student teaching. This occurred, in part, because the preservice teachers navigated different settings that conveyed conflicting ideas about the reasons why teachers make modifications. The methods course emphasized the importance of modifying materials to promote reform-based science teaching, but few preservice teachers observed their mentor teachers make adaptations for this reason. These findings have important implications for theoretical models on curriculum materials use and the design of science teacher education.

Brown, J. S., Collins, A., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics (Technical Report 403). Retrieved October 1, 2014, from http://files.eric.ed.gov/fulltext/ED284181.pdf

The differences between formal schooling and apprenticeship methods are many, but for our purposes, one is most important. Perhaps as a by-product of the specialization of learning in schools, skills and knowledge taught in schools have become abstracted from their uses in the

© 2015 Stanford Center for Assessment, Learning and Equity

world. In apprenticeship learning, on the other hand, target skills are not only continually in use by skilled practitioners, but are instrumental to the accomplishment of meaningful tasks. Said differently, apprenticeship embeds the learning of skills and knowledge in the social and functional context of their use. This difference is not academic, but has serious implications for the nature of the knowledge that students acquire. This paper attempts to elucidate some of those implications through a proposal for the retooling of apprenticeship methods for the teaching and learning of cognitive skills. Specifically, we propose the development of a new cognitive apprenticeship to teach students the thinking and problem-solving skills involved in school subjects such as reading, writing, and mathematics.

Bransford, J. D., Brown, A. L., & Cocking, R. R. National Research Council (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academies Press.

Darling-Hammond, L. (2012). *Powerful teacher education: Lessons from exemplary programs*. San Francisco, CA: John Wiley & Sons.

Epstein, A. S. (2006). *The intentional teacher: Choosing the best strategies for young children's learning.* Washington, DC: National Association for the Education of Young Children.

As educators we must act with knowledge and purpose to make sure young children acquire the skills and understanding they need to succeed. Planful, intentional teachers keep in mind the key goals for children's learning and development in all domains by creating supportive environments, planning curriculum, and selecting from a variety of teaching strategies those that best promote each child's thinking and skills. This book considers how and when each type of learning (child-guided, adult-guided, or a combination) is most effective and what teachers can do to support it. Eight chapters comprise this book: (1) Introducing Intentional Teaching; (2) Best Practices to Support Intentional Teaching; (3) Language and Literacy; (4) Mathematics and Scientific Literacy; (5) Social Skills and Understandings; (6) Physical Movement; (7) The Visual Arts; and (8) Reflections on Intentional Teaching. The book also includes acknowledgments, resources, references, and an index.

Hollins, E. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education, 62*(4), 395-407. doi: 10.1177/0022487111409415

The emphasis in this discussion was on making "visible the grammar of practice to novices" (p.2069). The grammar of practice is viewed in relationship to clearly identified components of practice. In applying this metaphor to the present discussion of a holistic practice-based approach to teacher preparation, the grammar of practice is the process of planning, enacting, interpreting, translation, planning, and (re)-enacting. The focus in this practice-based approach is on the relationship between characteristics of the learner, the learning process, pedagogy, and

© 2015 Stanford Center for Assessment, Learning and Equity

learning outcomes. In this holistic perspective, the processes of representation, decomposition, and approximation can be employed in the epistemic practices of focused inquiry, directed observation, and guided to practice to help candidates understand the anatomy of pedagogical practice.

Norman, P. (2011). Planning for what kind of teaching? Supporting cooperating teachers as teachers of planning. *Teacher Education Quarterly, 38*(3), 49-68.

Models of preservice teacher education that include year-long internships require classroom teachers who serve as school-based teacher educators to "bear a large burden for beginning teacher growth" (Bullough Jr., R., Draper, R., 2004, p. 409). The success of field-based internships rests on cooperating teachers' ability to view teacher candidates as learners of teaching and themselves as teachers of teaching. This means that preservice mentors not only understand the content to be taught—the learning to teach "curriculum"—but also are able to design learning opportunities based on knowledge of their intern and what she needs to learn (Feiman-Nemser & Remillard, 1996; Tomlinson, 1995). A core component of that curriculum of learning to teach is instructional planning. Considered a core task in "the work of teaching" (Ball & Forzani, 2009, p. 497), planning is often identified in university teacher preparation standards, state teacher certification standards, and more general standards for professional practice such as those developed by the Interstate New Teacher Assessment and Support Consortium (INTASC). Planning is a central task of teaching and a central focus in learning to teach. But what does planning entail, and how is planning best learned? What challenges do experienced teachers serving as school-based teacher educators face in becoming teachers of planning? What role can university teacher educators' play in helping mentor teachers learn to teach planning? As John (2006) notes, "How to plan well remains a knotty but crucial topic for teacher education research and practice" (p. 495). This article examines these questions by drawing on empirical data from a larger study where I examined how to reconfigure my role as a university field supervisor to support classroom teachers in learning the practice of field- based teacher education over a one-year period.

Reynolds, A. (1992). What is competent beginning teaching? A review of the literature. *Review of Educational Research*, *62*(1), 135. doi: 10.3102/00346543062001001

What does it mean to be a competent beginning teacher? This review melds findings from the literature on effective teaching with those of learning to teach in order to answer this question. It begins with a discussion of problems encountered in interpreting these bodies of research. Next, differences between beginning and experienced teachers are discussed in three broad domains of teaching tasks: preactive, interactive, and postactive. In the conclusion, recommendations are offered regarding what should be measured in performance-based assessments for teacher licensure.

© 2015 Stanford Center for Assessment, Learning and Equity

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi: 10.3102/0013189X015002004

To characterize the complex ways in which teachers think about the teaching process and how particular content should be taught, Shulman argued for pedagogical content knowledge. This includes both what makes it difficult for students to learn and understanding how to teach content by knowing "the ways of representing and formulating the subject that make it comprehensible to others", thus building a conceptual understanding and students' knowledge.

Tyler, R. W. (1950). *Basic principles of curriculum and instruction, syllabus for Education 360*. Chicago, IL: University of Chicago Press.

Wiggins, G., & McTighe, J. (2005). *Understanding by design (2e).* Alexandria, VA: Association for Supervision and Curriculum Development.

Rubric 2: Planning to Support Varied Learners' Needs

Guiding Question: *How does the candidate use knowledge of his/her learners to target support for learners to develop an understanding of concepts and other subject-specific elements in the discipline?*

Rubric Concept: *Planned supports are tied to learning objectives or central focus with attention to characteristics of the whole class, specific individuals, or groups with similar needs, AND students with IEPs and 504 plans.*

Banks, J., Cochran-Smith, M., Moll, L., Richert, A., Zeichner, K., LePage, P., Darling-Hammond, L., Duffy, H., & McDonald, M. (2005). Teaching diverse learners. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 232-274). San Francisco, CA: Jossey-Bass.

The development of competencies for teaching diverse learning includes an understanding of the impact of sociocultural, socioeconomic and multilingual complexities for teaching and learning contexts. This chapter provides a comprehensive discussion of diversity and how developing a sociocultural consciousness is a vital disposition in teaching.

© 2015 Stanford Center for Assessment, Learning and Equity

Edwards, C. J., Carr, S., & Siegel, W. (2006). Influences of experiences and training on effective teaching practices to meet the needs of diverse learners in schools. *Education, 126*(3). Retrieved from http://www.questia.com/library/journal/1G1-145681751/influences-of-experiences-and-training-on-effective

This paper discusses one component of an ongoing project to explore differentiated instruction (DI) as an approach for meeting the academic and related needs of the wide array of diverse learners in schools. The project, The 3 Dimensions (3D) of Diversity for Inclusion, was conceived at the September 2001 faculty meeting of the Department of Teaching and Learning at Southeastern Louisiana University. During the meeting, a report on the results from the prior academic year's annual student teacher exit survey was presented. The lowest ranked item on the exit survey indicated that teacher candidates need more intensive preparation to be able to work more effectively with diverse learners in schools. Subsequently, a small group of elementary and special education faculty met to discuss the survey finding. Hence, a task force was formed to determine actions for enhancing teacher candidates' preparation to recognize the academic, behavioral, cultural (3 dimensions/3D), and other dimensions for effectively teaching all learners in inclusive classes.

Hornby, G. (2014). Effective teaching strategies for inclusive special education. In *Inclusive Special Education* (pp. 61-82). New York, NY: Springer.

A key component of inclusive special education is the use of teaching strategies or interventions that have strong evidence of effectiveness and the avoidance of interventions that lack evidence of effectiveness. Teachers need to be able to identify the children with special educational needs and disabilities (SEND) in their classes and follow the practical guidelines for teaching them that are presented in the previous chapter. However, they need to go beyond this. They need to make sure that they use instructional strategies and interventions that have proven effectiveness for addressing the learning difficulties and managing the behavioral challenges which children with SEND present. This includes using interventions for facilitating the learning of academic skills such as reading, writing, and arithmetic, as well as the broader communication, social, and vocational skills necessary for independent living. It also includes using interventions for managing behavioral difficulties at individual, small-group, and class- wide levels. Therefore, teachers need to be able to evaluate interventions, strategies, and programs in terms of the adequacy of their research evidence bases so that they can select those that are evidence-based practices and avoid those that are not. They also need to know how to overcome various barriers to the implementation of evidence-based practices in schools, as well as the key issues to be addressed in bringing about change in order to embed evidence- based practices in the culture of schools. These issues are addressed in this chapter.

© 2015 Stanford Center for Assessment, Learning and Equity

Noble, T. (2004). Integrating the revised Bloom's taxonomy with multiple intelligences: A planning tool for curriculum differentiation. *The Teachers College Record*, *106*(1), 193-211.

Both the special education and gifted education literature call for a differentiated curriculum to cater for the wide range of student differences in any classroom. Gardner's theory of multiple intelligences was integrated with the revised Bloom's taxonomy to provide a planning tool for curriculum differentiation. Teachers' progress in using the tool to plan and implement units of work through learning centers was documented over 18 months in two small elementary schools. They reported greater confidence in their ability to broaden their curriculum and cater for different students' strengths across the multiple intelligences and intellectually challenge their students using first the original and then the revised taxonomy. The teachers saw their students as more successful learners as a result of this curriculum differentiation.

Rock, M. L., Gregg, M., Ellis, E., & Gable, R. A. (2008). REACH: A framework for differentiating classroom instruction. *Preventing School Failure: Alternative Education for Children and Youth*, *52*(2), 31-47.

Today, teachers are responsible not only for meeting the diverse needs of all students but also for ensuring improved educational outcomes. Accordingly, school personnel are seeking proven ways to strengthen traditional classroom practices. Beginning with the plight of two teachers—one general and one special education—the authors offer a rationale for differentiating instruction. Then they review the literature on differentiated instruction, highlighting the myths, models, and evidence to support it. The authors draw on the accumulated research to provide a framework for differentiating instruction. Using REACH as a mnemonic, the framework they developed includes a comprehensive inventory and several practical strategies for using it. They revisit the case vignette to illustrate the application of the REACH framework.

Subban, P. (2006). Differentiated instruction: A research basis. *International Education Journal*, *7*(7), 935-947.

With contemporary classrooms becoming increasingly diverse, educational authorities, teachers and school administrators are looking to teaching and learning strategies that cater for a variety of learning profiles. A paradigm that is gaining ground in many educational circles is differentiated instruction. This model proposes a rethinking of the structure, management and content of the classroom, inviting participants within the learning context to become engaged in the process, to the benefit of all. While the model has been accepted and set to work, there remains room for theoretical support to give it momentum. A recent, comprehensive analysis of the literature in this area examines this model, within the context of increasing academic diversity. This paper therefore seeks to synthesize the research supporting a shift to a new

© 2015 Stanford Center for Assessment, Learning and Equity

exemplar for modern education, and in so doing shed light on the rationale supporting differentiated instruction.

Tieso, C. (2005). The effects of grouping practices and curricular adjustments on achievement. *Journal for the Education of the Gifted*, *29*(1), 60-89.

The purpose of this study was to examine the effects of curricular (textbook, revised, and differentiated) and grouping (whole, between, and within-class) practices on intermediate students' achievement in mathematics. A pretest-posttest, quasi-experimental design using a stratified random sample of 31 teachers and their students (N = 645) was used in this study. Achievement data were collected using a curriculum-based assessment. Repeated measures analysis of variance was employed to investigate the effects of grouping arrangements and curricular design on the treatment and comparison group posttest scores. Results indicated significant differences, F (5, 246) = 22.618, p less than 0.001, between comparison and revision treatment groups on the posttest after adjusting for grade level (4 or 5). Further results indicated significant differences, F (11, 673) = 41.548, p less than 0.001, among all treatment groups after adjusting for grade level. Comparison of Textbook, Revised, and Differentiated Unit is appended. (Contains 6 tables.)

Tomlinson, C., Brighton, C., Hertberg, H., Callahan, C., Moon, T., Brimijoin, K., . . . Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classroom settings: A review of literature. *Journal for the Education of the Gifted, 27*(2/3), 119-145.

Both the current school reform and standards movements call for enhanced quality of instruction for all learners. Recent emphases on heterogeneity, special education inclusion, and reduction in out-of-class services for gifted learners, combined with escalations in cultural diversity in classrooms, make the challenge of serving academically diverse learners in regular classrooms seem an inevitable part of a teacher's role. Nonetheless, indications are that most teachers make few proactive modifications based on learner variance. This review of literature examines a need for “differentiated" or academically responsive instruction. It provides support in theory and research for differentiating instruction based on a model of addressing student readiness, interest, and learning profile for a broad range of learners in mixed-ability classroom settings.

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction & understanding by design: Connecting content and kids*. Alexandria, VA: Association for Supervision and Curriculum Development.

© 2015 Stanford Center for Assessment, Learning and Equity

Watts-Taffe, S., Laster, B., Broach, L., Marinak, B., McDonald Connor, C., & Walker-Dalhouse, D. (2012). Differentiated instruction: Making informed teacher decisions. *Reading Teacher, 66*(4), 303-314. doi: 10.1002/TRTR.01126

The importance of the role of differentiation with respect to diversity and with respect to Response to Intervention (RTI) is widely used to meet and support the varied learning needs of learners. Two examples of differentiated instruction in classroom contexts are provided and include the research and decision-making underlying the teacher's approach to differentiation.

Woo Sik, J., (2007). Preservice teacher training for successful inclusion. *Education, 128*(1), 106-113.

The purpose of this study was to investigate preservice teacher candidates' altitudes and confidence levels in working with students with special needs. Confidence levels have been shown to increase with training, exposure to specific situations, and knowledge utilizing explicit interventions. Also examined were the strengths and improvement of a specific teacher education program, the focus of which was to prepare preservice teacher candidates for working and teaching with special learners. The discussion of findings concludes that if training institutions are to assist in breaking down the barriers of preservice teachers' attitudes toward teaching students with special needs, then training might need to be extended to help raise the confidence level of preservice teachers. Training has been shown to be an influence on a teacher's self-efficacy and confidence related to teaching students with special needs. The results of this study indicated that type of academic preparation appeared to have an impact on attitudes of preservice teachers in teacher education programs. Student teachers who participated in guided field experiences expressed significantly more positive attitudes than student teachers who only completed a course toward including students with special needs in inclusive classroom settings.

Rubric 3: Using Knowledge of Students to Inform Teaching and Learning

Guiding Question: *How does the candidate use knowledge of his/her learners to justify instructional plans?*

Rubric Construct: *Candidate justifies why learning tasks (or adaptations) are appropriate using examples of students' personal/cultural/community assets and makes connections to research and/or theory about learning development.*

© 2015 Stanford Center for Assessment, Learning and Equity

Banks, J. A. (1993). Multicultural education: Historical development, dimensions, and practice. *Review of Research in Education*, 19(1), 3---49. doi: 10.3102/0091732X019001003

Banks developed five dimensions of multicultural practices through his research based on research, observations with teachers. One of these teaching dimensions is equity pedagogy. *Equity pedagogy* exists when teachers use techniques and methods that facilitate the academic achievement of students form diverse racial, ethnic, and social-class groups.

Banks, J., Cochran-Smith, M., Moll, L., Richert, A., Zeichner, K., LePage, P., Darling-Hammond, L., Duffy, H. & McDonald, M. (2005). Teaching diverse learners. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 232-274). San Francisco, CA: Jossey-Bass.

The development of competencies for teaching diverse learning includes an understanding of the impact of sociocultural, socioeconomic and multilingual complexities for teaching and learning contexts. This chapter provides a comprehensive discussion of diversity and how developing a sociocultural consciousness is a vital disposition in teaching.

Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., . . . White, C. E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, *39*(2), 188-215. doi: 10.1598/RRQ.39.2.3

Gaps in reading performance between Anglo and Latino children are associated with gaps in vocabulary knowledge. An intervention was designed to enhance fifth graders' academic vocabulary. The meanings of academically useful words were taught together with strategies for using information from context, from morphology, from knowledge about multiple meanings, and from cognates to infer word meaning. Among the principles underlying the intervention were that new words should be encountered in meaningful text, that native Spanish speakers should have access to the text's meaning through Spanish, that words should be encountered in varying contexts, and that word knowledge involves spelling, pronunciation, morphology, and syntax as well as depth of meaning. Fifth graders in the intervention group showed greater growth than the comparison group on knowledge of the words taught, on depth of vocabulary knowledge, on understanding multiple meanings, and on reading comprehension. The intervention effects were as large for the English-language learners (ELLs) as for the English-only speakers (EOs), though the ELLs scored lower on all pre- and posttest measures. The results show the feasibility of improving comprehension outcomes for students in mixed ELL-EO classes, by teaching word analysis and vocabulary learning strategies.

© 2015 Stanford Center for Assessment, Learning and Equity

Cartledge, G., & Kourea, L. (2008). Culturally responsive classrooms for culturally diverse students with and at risk for disabilities. *Exceptional Children*, *74*(3), 351-371. doi: 10.1177/001440290807400305

Culturally and linguistically diverse (CLD) students with and at risk for disabilities evidence the greatest need for quality instructional programs of all students in our schools because of disproportionate academic underachievement, special education referrals, and disciplinary actions. Authorities on culturally responsive instruction consistently point to the cultural dissonance between the home and school as a contributor to poor educational outcomes. Other researchers argue that these students are least likely to be taught with the most effective evidence-based instruction. This article discusses culturally responsive classrooms for CLD students with and at risk for disabilities within the context of culturally competent teachers, culturally effective instructional principles, and culturally appropriate behavior development. It discusses implications for educators and suggestions for a future agenda.

Darling-Hammond, L., & Snyder, J. (2000). Authentic assessment of teaching in context. *Teaching and Teacher Education, 16* (5), 523-545. doi:10.1016/S0742-051X(00)00015-9

The demands of teaching more challenging content to more diverse learners suggest a need for teacher education that enables teachers to become more sophisticated in their understanding of the effects of context and learner variability on teaching and learning. Instead of implementing set routines, teachers need to become ever more skillful in their ability to evaluate teaching situations and develop teaching responses that can be effective under different circumstances. This article examines how a growing number of *teacher education programs are using authentic assessmen*ts of teaching cases, exhibitions, portfolios, and problem-based inquiries (or action research) as tools to support teacher learning for these new challenges of practice...Teaching in ways that are responsive to students requires that teachers be able to engage in systematic learning from teaching contexts as well as from more generalized theory about teaching and learning.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106-116. doi: 10.1177/0022487102053002003

In this article, a case is made for improving the school success of ethnically diverse students through culturally responsive teaching and for preparing teachers in preservice education programs with the knowledge, attitudes, and skills needed to do this. The ideas presented here are brief sketches of more thorough explanations included in my recent book, Culturally Responsive Teaching: Theory, Research, and Practice (2000). Culturally responsive pedagogy is a distinct competency of knowledge and sensitivity to diversity as an integrated practice and way of thinking about planning and teaching needed to engage all students in learning. Culturally responsive teaching is defined as using the cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively. It is based on the

© 2015 Stanford Center for Assessment, Learning and Equity

assumption that when academic knowledge and skills are situated within the lived experiences and frames of reference of students, they are more personally meaningful, have higher interest appeal, and are learned more easily and thoroughly (Gay, 2000). As a result, the academic achievement of ethnically diverse students will improve when they are taught through their own cultural and experiential filters (Au & Kawakami, 1994; Foster, 1995; Gay, 2000; Hollins, 1996; Kleinfeld, 1975; Ladson-Billings, 1994, 1995).

Gonzalez, N., Moll, L. C., & Amanti, C. (Eds.). (2005). *Funds of knowledge: Theorizing practices in households, communities, and classrooms*. Mahwah, NJ: Erlbaum.

Funds of knowledge are an understanding of the social and cultural capital of students' local knowledge and community strengths to scaffold in teaching for student learning. It requires that preservice candidates navigate the fine line between fostering a deeper understanding of these communities and the neighborhoods surrounding their schools in order to uncover the 'community-based assets.' The concept of "funds of knowledge" is based on a simple premise: people are competent and have knowledge, and their life experiences have given them that knowledge. The claim in this book is that first-hand research experiences with families allow one to document this competence and knowledge, and that such engagement provides many possibilities for positive pedagogical actions.

Hill, H., Ball, D., & Schilling, S. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic specific knowledge of students. *Journal for Research in Mathematics Education, 39*(4), 372-400.

There is widespread agreement that effective teachers have unique knowledge of students' mathematical ideas and thinking. In this article, we describe an effort to conceptualize and develop measures of teachers' combined knowledge of content and students by writing, piloting and analyzing results from multiple-choice items. Results suggest partial success in measuring this domain among practicing teachers but also identify key areas around which the field must achieve conceptual and empirical clarity.

Hollins, E. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education, 62*(4), 395-407. doi: 10.1177/0022487111409415

In this article, the author presents a holistic practice-based approach, consisting of two parts, to preparing candidates for quality teaching. The first part describes the essential knowledge, skills, and habits of mind for quality teaching. The emphasis is on understanding the learning process as influenced by the cultural and experiential background of particular learners and the philosophical stance through which the purpose of school learning is appropriated. The philosophical stance influences the design of learning experiences, the framing of the curriculum,

© 2015 Stanford Center for Assessment, Learning and Equity

and the social context in classrooms. The second part describes the design of opportunities for leaning to teach with an emphasis on epistemic practices and program qualities. In this discussion, at the core, the practices in teacher preparation are a mirror image of practices for quality teaching in PK-12 schools. The standards of evidence for integrity and trustworthiness are the same in teacher preparation and in PK-12 schools.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465-491. doi: 10.3102/00028312032003465

In the midst of discussions about improving education, teacher education, equity, and diversity, little has been done to make pedagogy a central area of investigation. This article attempts to challenge notions about the intersection of culture and teaching that rely solely on microanalytic or macroanalytic perspectives. Rather, the article attempts to build on the work done in both of these areas and proposes a culturally relevant theory of education. By raising questions about the location of the researcher in pedagogical research, the article attempts to explicate the theoretical framework of the author in the nexus of collaborative and reflexive research. The pedagogical practices of eight exemplary teachers of African-American students serve as the investigative "site." Their practices and reflections on those practices provide a way to define and recognize culturally relevant pedagogy.

Lucas, T., Villegas, A. M., & Freedson-Gonzalez, M. (2008). Linguistically responsive teacher education preparing classroom teachers to teach English language learners. *Journal of Teacher Education*, *59*(4), 361-373. doi: 10.1177/0022487108322110

Students who speak languages other than English are a growing presence in U.S. schools. As a result, many mainstream classroom teachers are finding that they have English language learners in their classes. Unfortunately, most mainstream classroom teachers have had little or no preparation for providing the types of assistance that such learners need to successfully learn academic content and skills through English while developing proficiency in English. In this article, the authors identify a small set of principles that can serve as the linguistic foundation for the teaching of English language learners in mainstream classes. The authors then outline linguistically responsive pedagogical practices that flow directly from those principles. They conclude with concrete suggestions for how teacher education programs can incorporate the knowledge and skills that will prepare all preservice teachers to be linguistically responsive.

Lucas, T., & Villegas, A. M. (2013). Preparing linguistically responsive teachers: Laying the foundation in preservice teacher education. *Theory Into Practice*, *52*(2), 98-109. doi: 10.1080/00405841.2013.770327

It takes teachers many years to develop expertise in the complex set of knowledge, skills, and orientations needed to teach culturally and linguistically diverse (CLD) students well. The

© 2015 Stanford Center for Assessment, Learning and Equity

process begins in preservice preparation and continues into the early years of teaching and throughout a teacher's career. This article examines preservice teacher education as the first phase in the continuum of teacher development for teaching ELLs. Drawing on our framework of orientations and pedagogical knowledge and skills for preparing linguistically responsive teachers (Lucas & Villegas, 2011; Lucas, Villegas, & Freedson-Gonzalez, 2008), we show how Feiman-Nemser's (2001) framework of central tasks for learning to teach can serve as a guide for identifying tasks for learning to teach CLD students and for guiding the construction of a coherent approach to preparing teachers of CLD students that begins in preservice programs, laying the foundation for continued development throughout the teaching career.

Molina, S. (2013). The value of meaning-making and cultural knowledge for teachers working in culturally and linguistically diverse contexts. *Journal of Teaching and Teacher Education: An International Journal, 1*(1), 1-16.

The tapestry of classrooms today is transforming into a mosaic of colors, languages, and backgrounds. As the population of culturally and linguistically diverse students continues to rise, a deeper understanding of how teachers construct meaning and understand their internal and relational experiences when working with these students has become an important area to examine. This study included in-depth interviews with ten public school teachers in the San Diego area, which assessed the teachers' meaning-making systems and their cultural competence. The framework of constructive developmental theory (Kegan, 1982, 1994) was drawn upon to assess how teachers' make sense of their experiences, and the framework of cultural intelligence (Earley & Ang, 2003) was used to determine their cultural competence. Although both frameworks provided some insight into this phenomenon, their limitations far exceeded their utility in terms of understanding the complex ways in which teachers understand and approach their work with culturally and linguistically diverse students. Additional frameworks for understanding teacher -student interactions are considered.

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Schmeichel, M. (2012). Good teaching? An examination of culturally relevant pedagogy as an equity practice. *Journal of Curriculum Studies, 42*(2), 211-231. doi: 10.1080/00220272.2011.591434

The adoption of educational policy measures to close the achievement gap, as well as the significant amount of scholarship dedicated to the subject, are just some of the indicators that reflect the tremendous concern in education about the academic performance of students of color. Within research aimed at promoting equitable practices in education, culturally relevant teaching has emerged as a good teaching strategy to improve achievement. The take-up of

© 2015 Stanford Center for Assessment, Learning and Equity

culturally relevant teaching as something that a teacher can 'do', instead of a critical stance that a teacher takes, is also examined and critiqued.

Villegas, A. & Lucas, T. (2007). The culturally responsive teacher. *Educational Leadership, 64*(6), 28-33.

A view of all students as capable learners is particularly critical to the success of those from diverse cultural and linguistic backgrounds in the face of increasing demographic diversity of learners and communities. The guidelines for examining the key components of culturally responsive practices are provided.

Weinstein, C. S., Tomlinson-Clarke, S., & Curran, M. (2004). Toward a conception of culturally responsive classroom management. *Journal of Teacher Education*, *55*(1), 25-38. doi: 10.1177/0022487103259812

Given the increasing diversity of our classrooms, a lack of multicultural competence can exacerbate the difficulties that novice teachers have with classroom management. Definitions and expectations of appropriate behavior are culturally influenced, and conflicts are likely to occur when teachers and students come from different cultural backgrounds. The purpose of this article is to stimulate discussion of culturally responsive classroom management (CRCM). We propose a conception of CRCM that includes five essential components: (a) recognition of one's own ethnocentrism; (b) knowledge of students' cultural backgrounds; (c) understanding of the broader social, economic, and political context; (d) ability and willingness to use culturally appropriate management strategies; and (e) commitment to building caring classrooms. In the final section of the article, we suggest questions and issues for future research.

Rubric 4: Identifying and Supporting Language Demands

Guiding Question: *How does the candidate identify and support language demands associated with a key subject-specific learning task?*

Rubric Construct: *Candidate identifies language demand(s) (i.e. language function, vocabulary, discourse, and/or syntax) associated with a learning task. Plans include general support for use of at least two language demands. Includes support for students at different levels of language learning.*

© 2015 Stanford Center for Assessment, Learning and Equity

Baumann, J. F., & Graves, M. F. (2010). What is academic vocabulary? *Journal of Adolescent & Adult Literacy*, *54*(1), 4-12. doi: 10.1598/JAAL.54.1.1

The article comments on how the term "academic vocabulary" should be defined. The discussion focuses on the constructs of academic vocabulary with a comparison of various definitions of the term. Topics include typologies used to organize academic vocabulary and procedures used to identify academic vocabulary for teaching purposes. An example is given of how a content teacher could use a categorized academic vocabulary for instruction. Sources of academic words are recommended that can be used by instructors of adolescents. Domain- specific and general academic vocabularies are discussed. Studies on categorizing academic vocabulary and selecting words to teach are noted.

Bunch, G. C. (2013). Pedagogical language knowledge: Preparing mainstream teachers for English learners in the new standards era. *Review of Research in Education*, *37*(1), 298-341. doi: 10.3102/0091732X12461772

Sooner or later, as schools move to implement the new Common Core and other forthcoming standards, almost every teacher in the United States will face the challenge of how to support students from homes where English is not the dominant language in meeting subject-matter academic expectations that require increasingly demanding uses of language and literacy in English. In this chapter, I review research that provides potential insights on how “mainstream” teachers might be prepared for responding to this challenge, both in preservice teacher preparation programs and throughout their careers. I argue that efforts to prepare teachers for working with English learners (ELs) to engage with increasing language and literacy expectations across the curriculum requires development of *pedagogical language knowledge* (Galguera, 2011)—not to “teach English” in the way that most mainstream teachers may initially conceive of (and resist) the notion, but rather to purposefully enact opportunities for the development of language and literacy in and through teaching the core curricular content, understandings, and activities that teachers are responsible for (and, hopefully, excited about) teaching in the first place. I review recent literature that presents various approaches to what this knowledge might entail and how teacher preparation and development initiatives might go about fostering it. I conclude by proposing that, in an age of increasing linguistic demands associated with new academic expectations, building teachers’ understanding of language as *action* (van Lier & Walqui, 2012) could serve as the foundation for preparing them to engage—and support—ELs in both challenging and meaningful academic tasks.

Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., Lively, T.J., & White, C.E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, *39*(2), 188-215. doi: 10.1598/RRQ.39.2.3

© 2015 Stanford Center for Assessment, Learning and Equity

Gaps in reading performance between Anglo and Latino children are associated with gaps in vocabulary knowledge. An intervention was designed to enhance fifth graders' academic vocabulary. The meanings of academically useful words were taught together with strategies for using information from context, from morphology, from knowledge about multiple meanings, and from cognates to infer word meaning. Among the principles underlying the intervention were that new words should be encountered in meaningful text, that native Spanish speakers should have access to the text's meaning through Spanish, that words should be encountered in varying contexts, and that word knowledge involves spelling, pronunciation, morphology, and syntax as well as depth of meaning. Fifth graders in the intervention group showed greater growth than the comparison group on knowledge of the words taught, on depth of vocabulary knowledge, on understanding multiple meanings, and on reading comprehension. The intervention effects were as large for the English-language learners (ELLs) as for the English-only speakers (EOs), though the ELLs scored lower on all pre- and posttest measures. The results show the feasibility of improving comprehension outcomes for students in mixed ELL-EO classes, by teaching word analysis and vocabulary learning strategies.

Cummins, J. (1984). Wanted: A theoretical framework for relating language proficiency to academic achievement among bilingual students. In C. Rivera (Ed.), *Language proficiency and academic achievement. Multilingual Matters 10*. 2-19. Clevedon, Avon, England: Multilingual Matters.

It is argued in the present paper that a major reason for the confused state of the art of language proficiency assessment in bilingual programs (and indeed for the confusion surrounding the rationale for bilingual education) stems from the failure to develop an adequate theoretical framework for relating language proficiency to academic achievement. Without such a theoretical framework it is impossible either to develop rational entry and exit criteria for bilingual programs or to design testing procedures to assess these criteria. Before elaborating the present theoretical framework, an outline of the evolution of its central tenets will be presented. The purpose of this is two-fold: first, to illustrate how the construct of "language proficiency" is central to a variety of seemingly independent issues in the education of language minority and majority students; and second, to help clarify how the present framework is related to theoretical constructs elaborated in previous papers.

Fillmore, L. W., & Snow, C. E. (2000). *What teachers need to know about language*. Washington, DC: Center for Applied Linguistics. Retrieved September 12, 2014, from http://files.eric.ed.gov/fulltext/ED444379.pdf

Today's teachers need access to a wide range of information to function in the classroom. They need a thorough understanding of how language figures in education, and for that reason they must receive systematic and intensive preparation in educational linguistics. A thorough grounding in linguistics would support teachers' undertakings overall, and in particular in

© 2015 Stanford Center for Assessment, Learning and Equity

teaching literacy skills and working with English language learners. If approached coherently, such preparation would also cover many of the desired teacher competencies, relating to skills in assessing children, in individualizing instruction, and in respecting diversity. This paper lays out a rationale for why current and prospective teachers need to know more about language, and what specific sorts of knowledge they need. Requisite knowledge about oral language, oral language used in formal and academic contexts, and written language is discussed. In the final section, courses are suggested that teacher preparation programs should offer to teacher candidates. This course list may also be seen as specifying aspects of an integrated, in-depth professional development program for inservice teachers. A glossary is appended.

Galguera, T. (2011). Participant structures as professional learning tasks and the development of pedagogical language knowledge among preservice teachers. *Teacher Education Quarterly*, *38*(1), 85-106.

English-Language Learners (ELLs, English-Learners, ELs) are a particularly challenging sector of the student population in United States schools. They constitute an increasingly larger presence in most school districts, growing 51 percent in ten years to 5.1 million in 2006. Despite becoming more common, schools have yet to figure out ways to meet the needs of these students, who continue to lag behind in most academic achievement measures. Although "English-Language-Learner" is an important demographic category, the designation is problematic as a reference point for teaching practice among teachers and teacher educators. In this article the author argues for a shift in the definition of teaching practice for teachers and teacher educators away from "English learners" toward "language use for academic purposes" as a perspective from which to examine their practice. This self-study is an instance of a teacher educator interested in experiential, hands-on pedagogy to foster critical language awareness among preservice teachers. The author begins by proposing a re-conceptualization of teaching and teacher preparation in terms of learning outcomes, not student types. He argues that "English-Language-Learners" is (a) both too broad and not inclusive enough, (b) likely to elicit views of students as deficient, (c) not conducive to "one-size-fits-all" approaches (Reyes, 1992), and (d) lacking a widely-accepted theory or model to explain the relationship between teaching and learning. He then analyzes his students' developing awareness of academic language after completing two PLTs, one in English, the other in Spanish. After discussing findings, the author closes with conclusions and recommendations regarding academic language use as another form of pedagogical content knowledge.

Gibbons, P. (2002). *Scaffolding language, scaffolding learning: Teaching second language learners in the mainstream classroom*. Portsmouth, NH: Heinemann.

Language learning is not a simple linear process, but involves the ongoing development of skills for a range of purposes. Gibbons sees this development as largely the result of the social contexts and interactions in which learning occurs. By focusing on the ways in which teachers can "scaffold" language and learning in the content areas, she takes a holistic approach--one

© 2015 Stanford Center for Assessment, Learning and Equity

that appreciates the struggle of students learning a new language, while simultaneously developing subject knowledge in it, and the challenge for teachers to address these needs.

Kamil, M. L., Mosenthal, P. B., Pearson, P. D., & Barr, R. (Eds.). (2000). *Handbook of reading research: Volume III*. New York, NY: Routledge.

Nagy, W., & Townsend, D. (2012). Words as tools: Learning academic vocabulary as language acquisition. *Reading Research Quarterly, 47*(1), 91-108. doi: 10.1002/RRQ.011

There is a growing awareness of the importance of academic vocabulary, and more generally, of academic language proficiency, for students' success in school. There is also a growing body of research on the nature of the demands that academic language places on readers and writers, and on interventions to help students meet these demands. In this review, we discuss the role of academic vocabulary within academic language, examine recent research on instruction in academic vocabulary, considering both general academic words and discipline- specific words, and offer our perspective on the current state of this research and recommendations on how to continue inquiry and to improve practice in this area. We use the metaphor of 'words as tools' to reflect our understanding that instruction in academic vocabulary must approach words as means for communicating and thinking about disciplinary content, and must therefore provide students with opportunities to use the instructed words for these purposes as they are learning them.

Santos, M., Darling-Hammond, L., & Cheuk, T. (2012). Teacher development to support English language learners in the context of Common Core State Standards. In *Understanding Language Conference, Stanford University, California.* Available at: http://ell.stanford.edu/publication/teacher-development-appropriate-support-ells

Saunders, W., & Goldenberg, C. (2010). Research to guide English language development instruction. In *Improving education for English learners: Research-based approaches* (pp. 21-81). Sacramento, CA: California Department of Education Press.

The purpose of this chapter is to synthesize existing research that provides direction for English language development (ELD) instruction. Many sources and resources might guide the direction of ELD instruction, including theory, research, ELD standards, practitioner experience, and published programs. This chapter focuses on research, specifically studies and research syntheses that help identify specific guidelines for effective ELD instruction.

© 2015 Stanford Center for Assessment, Learning and Equity

Scarcella, R. (2003). *Academic English: A conceptual framework* (Technical Report 2003- 1). Santa Barbara, CA: University of California Linguistic Minority Research Institute.

Learning academic English is probably one of the surest, most reliable ways of attaining socio-economic success in the United States today. Learners cannot function in school settings effectively without it. This variety of English entails the multiple, complex features of English required for success in public schooling and career advancement. It involves mastery of a writing system and its particular academic conventions as well as proficiency in reading, speaking, and listening. Unfortunately, academic English has often been ignored or under- emphasized in public school instruction. Many have not understood its importance in helping students function in school settings or have misunderstood its complex nature. This paper discusses approaches to the study of academic English and presents a multi-dimensional framework for analyzing it. The dimensions include linguistic, cognitive, and socio- cultural/psychological ones. The paper also describes the relationship between the English used in everyday situations and in academic ones. It concludes with a brief discussion of research implications pertaining to instruction, assessment, and professional development.

Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective*. Mahwah, NJ: Erlbaum.

Schleppegrell, M. J. (2012). Academic language in teaching and learning. *The Elementary School Journal*, *112*(3), 409-418.

Success in school calls for using language in new ways to accomplish increasingly challenging discursive tasks across grade levels and school subjects. As children develop new knowledge, they also need support in using language in new ways. This introduction to the special issue offers insights into the challenges and affordances of developing academic language and suggests implications for pedagogy, teacher education, and further research.

Snow, C. E., & Uccelli, P. (2009). The challenge of academic language. In D. R. Olson & N. Torrance (Eds.), *The Cambridge handbook of literacy* (pp. 112-133). Cambridge, UK: Cambridge University Press.

Spycher, P. (2009). Learning academic language through science in two linguistically diverse kindergarten classes. *Elementary School Journal, 109*(4), 359-379. doi: 10.1086/593938

This study examined the effectiveness of an intentional versus an implicit approach to English oral language development in young children. A vocabulary intervention in science was developed using previous research on effective vocabulary and science instruction. Participants were 39 English-learning, bilingual, and monolingual English-speaking kindergartners from lower-socioeconomic backgrounds in 2 intact classrooms in an urban school in California. The 5- week-

© 2015 Stanford Center for Assessment, Learning and Equity

long intervention was implemented in 1 classroom where the students' regular classroom teacher taught 20 academic words from texts from the existing science curriculum in addition to the regular science curriculum. The control class received the regular science curriculum from the same teacher without the explicit vocabulary instruction. I used the Emergent Science Vocabulary Assessment, a picture test, to ascertain receptive vocabulary knowledge. I used the Conceptual Interviews on Scientific Understanding, a one-on-one interview protocol, to ascertain expressive knowledge of the words and scientific conceptual understanding related to the words. Findings showed that the intervention class learned more target words than the control class and that students who knew more of the vocabulary expressed their understanding of scientific concepts more effectively. I discuss instructional implications.

Strickland, D. S., & Riley-Ayers, S. (2006). *Early literacy: Policy and practice in the preschool years* (National Institute for Early Education Research Policy Brief 10), 1-12. Retrieved July 21, 2014, from http://www.readingrockets.org/article/11375

This policy brief reviews the literature on developing literacy (oral language, alphabetic code, print knowledge/concepts) in the early years, and provides recommendations for developing and using assessment to guide instruction, professional development and training, and comprehensive curricula that promotes literacy.

Townsend, D. R., Filippini, A., Collins, P., & Biancarosa, G. (2012). Evidence for the importance of academic word knowledge for the academic achievement of diverse middle school students. *The Elementary School Journal*, *112*(3), 497–518. doi: 10.1086/663301

Despite the current theoretical momentum for the importance of academic English and the acknowledgment that academic materials increase in complexity through the grades, little empirical attention has been devoted to the role of academic English in academic achievement. This study examined the amount of variance in academic achievement explained by academic word knowledge for diverse middle school students. A linguistically and socioeconomically diverse sample of grade 7 and 8 students (N = 339) was administered measures of overall breadth of vocabulary knowledge and general (i.e., cross-discipline) academic word knowledge, and the explanation of variance in standardized academic achievement tests across 4 disciplines was explored. For the entire sample, knowledge of general academic words explained a considerable and significant amount of variance in academic achievement across 4 disciplines. Findings lend empirical support to current calls for providing academic language support for early adolescents from non-native English speaking and low-socioeconomic backgrounds.

Valdés, G., Bunch, G., Snow, C., Lee, C., & Matos, L. (2005). Enhancing the development of students' language(s). In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp.126-168). San Francisco, CA: Jossey-Bass.

© 2015 Stanford Center for Assessment, Learning and Equity

van Lier, L., & Walqui, A. (2012). Language and the Common Core Standards. *Commissioned Papers on Language and Literacy Issues in the Common Core State Standards and Next Generation Science Standards, 94*, 44. Stanford, CA: Stanford University.

Vygotsky, L. (1987). *Thought and language*. Cambridge, MA: MIT Press.

Walqui, A., & van Lier, L. (2010). *Scaffolding the academic success of adolescent English language learners: A pedagogy of promise*. San Francisco, CA: WestEd.

Whitehurst, G. J., & Lonigan, C. J. (2001). Emergent literacy: Development from prereaders to readers. In S. B. Neuman & C. K. Dickinson (Eds.), *Handbook of early literacy research* (pp.11-29). New York, NY: Guilford Press.

Zwiers, J. (2007). Teacher practices and perspectives for developing academic language. *International Journal of Applied Linguistics*, *17*(1), 93-116.

This study investigates the ways in which middle school teachers in the USA develop academic language in intermediate-level English learners who attend mainstream content classes. Analysis of field notes, transcripts, and student work show that (a) academic language and higher-order thinking skills are closely linked, and (b) classroom discourse patterns and activities both develop and impede language growth. The teachers used four principle communication strategies: questioning, gestures, connecting to background knowledge with examples and analogies, and personifying. The results suggest that students, despite growth in certain dimensions of cognition and language, also learn counter-productive "rules of school". This research is intended to benefit the millions of 'non-mainstream' students worldwide who struggle in schools that have been created and shaped to serve mainstream purposes.

Zwiers, J. (2008). *Building academic language: Essential practices for content classrooms, grades 5-12*. San Francisco, CA: Jossey-Bass/John Wiley.

Zwiers, J. (2014). *Building academic language: Meeting Common Core Standards across disciplines, grades 5-12, 2nd edition*. San Francisco, CA: Jossey-Bass/John Wiley.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 5: Planning Assessments to Monitor and Support Student Learning

Guiding Question: *How does the candidate plan to monitor and support student learning?*

Rubric Concept: *Candidate plans for assessment(s) that provide evidence to monitor students' understanding of related subject-specific concepts, learning elements, and/or skill sets. Includes adaptations required by IEPs or 504 plans.*

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education*, *5*(1), 7-74. doi:10.1080/0969595980050102

This article is a review of the literature on classroom formative assessment. Several studies show firm evidence that innovations designed to strengthen the frequent feedback that students receive about their learning yield substantial learning gains. The perceptions of students and their role in self-assessment are considered alongside analysis of the strategies used by teachers and the formative strategies incorporated in such systemic approaches as mastery learning. There follows a more detailed and theoretical analysis of the nature of feedback, which provides a basis for a discussion of the development of theoretical models for formative assessment and of the prospects for the improvement of practice.

Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139–148. doi: 10.1177/003172171009200119

In this article, the authors discuss the use of formative assessment to improve classroom performance and to promote student achievement. The article asserts that little attention is paid to classroom performance when reform initiatives are introduced. The authors argue that the responsibility for classroom performance should not be left to the teacher alone; assistance should come from the administration and educational programs. The article proposes the use of formative assessment so that teachers know what the students are learning and how they are learning.

Bloom, B. S., Madaus, G. F., & Hastings, J. T. (1981). *Evaluation to improve learning*. New York, NY: McGraw-Hill.

Clark, I. (2012). Formative assessment: Assessment is for self-regulated learning. *Educational Psychology Review, 24*(2), 205–249. doi: 10.1007/s10648-011-9191-6

© 2015 Stanford Center for Assessment, Learning and Equity

The article draws from 199 sources on assessment, learning, and motivation to present a detailed decomposition of the values, theories, and goals of formative assessment. This article will discuss the extent to which formative feedback actualizes and reinforces self-regulated learning (SRL) strategies among students. Theoreticians agree that SRL is predictive of improved academic outcomes and motivation because students acquire the adaptive and autonomous learning characteristics required for an enhanced engagement with the learning process and subsequent successful performance. The theory of formative assessment is found to be a unifying theory of instruction, which guides practice and improves the learning process by developing SRL strategies among learners. In a postmodern era characterized by rapid technical and scientific advance and obsolescence, there is a growing emphasis on the acquisition of learning strategies that people may rely on across the entire span of their life. Research consistently finds that the self-regulation of cognitive and affective states supports the drive for lifelong learning by: enhancing the motivational disposition to learn, enriching reasoning, refining meta-cognitive skills, and improving performance outcomes. The specific purposes of the article are to provide practitioners, administrators and policy-makers with: (a) an account of the very extensive conceptual territory that is the 'theory of formative assessment' and (b) how the goals of formative feedback operate to reveal recondite learning processes, thereby reinforcing SRL strategies which support learning, improve outcomes and actualize the drive for lifelong learning.

Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, *1*(1), 3-31.

Much evaluation of teaching focuses on what teachers do in class. This article focuses on the evaluation of assessment arrangements and the way they affect student learning out of class. It is assumed that assessment has an overwhelming influence on what, how and how much students study. The article proposes a set of 'conditions under which assessment supports learning' and justifies these with reference to theory, empirical evidence and practical experience. These conditions are offered as a framework for teachers to review the effectiveness of their own assessment practice.

Glaser, R., Chudowsky, N., & Pellegrino, J. W. (Eds.). (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academies Press.

Harlen, W. (2005). Teachers' summative practices and assessment for learning--tensions and synergies. *The Curriculum Journal*, *16*(2), 207-223. doi:10.1080/09585170500136093

This article concerns the use of assessment for learning (formative assessment) and assessment of learning (summative assessment), and how one can affect the other in either positive or negative ways. It makes a case for greater use of teachers' judgments in summative assessment,

© 2015 Stanford Center for Assessment, Learning and Equity

the reasons for this being found in the research that is reviewed in the first sections of the article. This research, concerning the impact of summative assessment, particularly high-stakes testing and examinations, on students' motivation for learning and on teachers and the curriculum, reveals some seriously detrimental effects. Suggestions for changes that would reduce the negative effects include making greater use of teachers' summative assessment. However, this raises other issues, about the reliability and validity of teachers' assessment. Research on ways of improving the dependability of teachers' summative assessment suggests actions that would equally support more effective use of assessment to help learning. The later sections of the article address the issues and opportunities relating to the possibility of assessment that serves both formative and summative purposes, with examples of what this means in practice, leading to the conclusion that the distinction between formative and summative purposes of assessment should be maintained, while assessment systems should be planned and implemented to enable evidence of students' ongoing learning to be used for both purposes.

Herman, J. L. (1992). What research tells us about good assessment. *Educational Leadership*, *49*(8), 74-78.

Herman, J.L., Aschbacher, P.R., & Winters, L. (1992). *A practical guide to alternative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Guidance is offered on the creation and use of alternative assessment; and a process model is presented that links assessment with curriculum and instruction, based on contemporary theories of learning and cognition. The introductory chapter, "Rethinking Assessment," provides background on the purposes of assessment and the need for new alternatives, plus an overview of key assessment development issues. Linking assessment and instruction is the focus of Chapter 2, which also reviews current trends in assessment. Chapter 3 considers determining the purpose of the assessment, and Chapter 4 reviews selecting assessment tasks and matching them to student outcomes. Setting the criteria for judging student performance is discussed in Chapter 5. Chapter 6 reviews the steps necessary to ensure reliable scoring. Chapter 7 makes the important point that assessment is not an end in itself, but rather a tool for decision- making. In this context, reliability and validity of assessments are discussed. There are 26 figures illustrating the discussion.

Linn, R. L., Baker, E. L., & Dunbar, S. B. (1991). Complex, performance-based assessment: Expectations and validation criteria. *Educational Researcher*, *20*(8), 15-21. doi: 10.3102/0013189X020008015

In recent years there has been an increasing emphasis on assessment results, as well as increasing concern about the nature of the most widely used forms of student assessment and uses that are made of the results. These conflicting forces have helped create a burgeoning

© 2015 Stanford Center for Assessment, Learning and Equity

interest in alternative forms of assessments, particularly complex, performance-based assessments. It is argued that there is a need to rethink the criteria by which the quality of educational assessments are judged, and a set of criteria that are sensitive to some of the expectations for performance-based assessments is proposed.

Popham, W. J. (2003). *Test better, teach better: The instructional role of assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Shepard, L. A. (2001). The role of classroom assessment in teaching and learning. In V. Richardson (Ed.), *Handbook of research on teaching, 4th ed*. (pp. 1066–1101). Washington, DC: American Educational Research Association.

Shepard, L. A. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, *63*(3), 66-70.

Formative assessment and instructional scaffolding are essentially the same thing. Formative assessment uses insights about a learner's current understandings to alter the course of instruction and thus support the development of greater competence. Scaffolding refers to supports that teachers provide the learner during problem solving--in the form of reminders, hints, and encouragement--to ensure successful completion of a task. Four strategies illustrate the strong connection between formative assessment and research on learning: eliciting prior knowledge, providing effective feedback, teaching for transfer of knowledge, and encouraging student self-assessment.

Shepard, L., Hammerness, K., Darling-Hammond, L., Rust, F., Bartz Snowden, J., Gorden, . . . Pacheco, A. (2005). Assessment. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 275-326). San Francisco, CA: Jossey-Bass.

Wiliam, D. (2011). What is assessment for learning*? Studies in Educational Evaluation, 37*, 3-14. doi:10.1016/j.stueduc.2011.03.001

The idea that assessment is intrinsic to effective instruction is traced from early experiments in the individualization of learning through the work of Benjamin Bloom to reviews of the impact of feedback on learners in classrooms. While many of these reviews detailed the adverse impact of assessment on learning, they also indicated that under certain conditions assessment had considerable potential to enhance learning. It is shown that understanding the impact that assessment has on learning requires a broader focus than the feedback intervention itself, particularly the learner's responses to the feedback, and the learning milieu in which the feedback operates. Different definitions of the terms ''formative assessment'' and ''assessment for learning'' are discussed, and subsumed within a broad definition that focuses on the extent

© 2015 Stanford Center for Assessment, Learning and Equity

to which instructional decisions are supported by evidence. The paper concludes by exploring some of the consequences of this definition for classroom practice.

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education: Principles, Policy and Practice*, *11*(1), 49-65. doi: 10.1080/0969594042000208994

While it is generally acknowledged that increased use of formative assessment (or assessment for learning) leads to higher quality learning, it is often claimed that the pressure in schools to improve the results achieved by students in externally-set tests and examinations precludes its use. This paper reports on the achievement of secondary school students who worked in classrooms where teachers made time to develop formative assessment strategies. A total of 24 teachers (2 science and 2 mathematics teachers, in each of six schools in two LEAs) were supported over a six-month period in exploring and planning their approach to formative assessment, and then, beginning in September 1999, the teachers put these plans into action with selected classes. In order to compute effect sizes, a measure of prior attainment and at least one comparison group was established for each class (typically either an equivalent class taught in the previous year by the same teacher, or a parallel class taught by another teacher). The mean effect size was 0.32.

© 2015 Stanford Center for Assessment, Learning and Equity

Task 2: Instruction

Rubric 6: Learning Environment

Guiding Question: *How does the candidate demonstrate a respectful learning environment that supports learners' engagement in learning?*

Rubric Concept: *Candidate demonstrates respect for and rapport with students, providing a positive and challenging learning environment that allows varied perspectives.*

Ball, A. (2002). Three decades of research on classroom life: Illuminating the classroom communicative lives of America's at-risk students. *Review of Research in Education, 26*(1), 71-111. doi:10.3102/0091732X026001071

Language is the medium and the vehicle through which teaching and learning take place, whether it is through oral or written language, visual literacies, multiple literacies, or verbal and nonverbal symbolic systems. According to Gee and Green (1998), the research on classroom discourse has provided understandings of the ways in which opportunities for learning are constructed across time, groups, and events; how knowledge constructed in classrooms shapes, and is shaped by, discursive activity and social practices; how patterns of practice simultaneously support and constrain access to the academic content of the "official" curriculum; and how opportunities for learning are influenced by the actions of actors beyond the classroom setting (p.84).

Becker, B., & Luthar, S. (2002). Social-emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educational Psychologist*, 37(4), 197-214. doi:10.1207/S15326985EP3704_1

Despite concentrated efforts at improving inferior academic outcomes among disadvantaged students, a substantial achievement gap between the test scores of these students and others remains (Jencks & Phillips, 1998; National Center for Education Statistics, 2000a, 2000b; Valencia & Suzuki, 2000). Existing research used ecological models to document social– emotional factors at multiple levels of influence that undermine academic performance. Various perspectives in a comprehensive and interdisciplinary model that will inform policy makers, administrators, and schools about the social–emotional factors that act as both risk and protective factors for disadvantaged students' learning and opportunities for academic success. Four critical social–

© 2015 Stanford Center for Assessment, Learning and Equity

emotional components that influence achievement performance (academic and school attachment, teacher support, peer values, and mental health) are reviewed.

Durlak, J., Weissberg, R., Dymnicki, A., Taylor, R., & Schellinger, K., (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405-432. doi: 10.1111/j.1467-8624.2010.01564.x

This article presents findings from a meta-analysis of 213 school-based, universal social and emotional learning (SEL) programs involving 270,034 kindergarten through high school students. Compared to controls, SEL participants demonstrated significantly improved social and emotional skills, attitudes, behavior, and academic performance that reflected an 11- percentile-point gain in achievement. School teaching staff successfully conducted SEL programs. The use of 4 recommended practices for developing skills and the presence of implementation problems moderated program outcomes. The findings add to the growing empirical evidence regarding the positive impact of SEL programs. Policy makers, educators, and the public can contribute to healthy development of children by supporting the incorporation of evidence-based SEL programming into standard educational practice.

Emmer, E.T., & Stough, L.M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychologist*, *36*(2), 103-112. doi:10.1207/S15326985EP3602_5

Research on classroom management is reviewed, with an emphasis on lines of inquiry originating in educational psychology with implications for teacher education. Preventive, group based approaches to management provide a basis for teachers to plan and organize classroom activities and behaviors. Studies of teacher expertise and affect provide additional perspective on teacher development and on factors that influence management. Cooperative learning activities and inclusion of children with special needs illustrate particular contexts that affect management. Utilization of classroom management content in educational psychology components of teacher preparation is discussed.

Evertson, C.M., & Weinstein, C.S. (Eds.). (2006). *Handbook of classroom management: Research, practice, and contemporary issues*. Mahwah, NJ: Erlbaum.

Kane, T. J., & Staiger, D. O. (2012). *Gathering feedback for teaching: Combining high-quality observations with student surveys and achievement gains (*Research Paper). MET Project. Seattle, WA: Bill & Melinda Gates Foundation.

There is a growing consensus that teacher evaluation in the United States is fundamentally broken. Few would argue that a system that tells 98 percent of teachers they are "satisfactory"

© 2015 Stanford Center for Assessment, Learning and Equity

benefits anyone--including teachers. The nation's collective failure to invest in high quality professional feedback to teachers is inconsistent with decades of research reporting large disparities in student learning gains in different teachers' classrooms (even within the same schools). Many states and school districts are looking to reinvent the way they do teacher evaluation and feedback, and they want better tools. With the help of nearly 3,000 teacher-volunteers, the Measures of Effective Teaching (MET) project is evaluating alternative ways to provide valid and reliable feedback to teachers for professional development and improvement. In this report, the authors focus on the value of classroom observations.

LePage, P., Darling-Hammond, L., Akar, H., Gutierrez, C., Jenkins-Gunn, E., & Rosebrock, K. (2005). Classroom management. In L. Darling-Hammond & J. Bransford (Eds.), ***Preparing teachers for a changing world: What teachers should learn and be able to do*** **(pp. 327-357). San Francisco, CA: Jossey-Bass.**

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., . . . Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. ***Child Development***, ***79***(3), 732-749. doi: 10.1111/j.1467-8624.2008.01154.x

This study examined development of academic, language, and social skills among 4-year-olds in publicly supported prekindergarten (pre-K) programs in relation to 3 methods of measuring pre- K quality, which are as follows: (a) adherence to 9 standards of quality related to program infrastructure and design, (b) observations of the overall quality of classroom environments, and (c) observations of teachers' emotional and instructional interactions with children in classrooms. Participants were 2,439 children enrolled in 671 pre-K classrooms in 11 states. Adjusting for prior skill levels, child and family characteristics, program characteristics, and state, teachers' instructional interactions predicted academic and language skills and teachers' emotional interactions predicted teacher-reported social skills. Findings suggest that policies, program development, and professional development efforts that improve teacher–child interactions can facilitate children's school readiness.

Patrick, H., Kaplan, A., & Ryan, A. (2011). Positive classroom motivational environments: Convergence between mastery goal structure and classroom social climate. ***Journal of Educational Psychology, 103***(2), 367-382. doi:10.1037/a0023311

Classroom climate research has identified specific areas of teachers' social practices that are related to students' motivation and engagement Achievement goal theory and classroom climate researchers have separately identified aspects of classroom environments that promote students' motivation, engagement, and achievement. In recent goal theory research, researchers have noted considerable shared variance between mastery goal structure and dimensions of the classroom social environment, particularly teacher support (Patrick et al., 2001; Patrick et al.,

© 2015 Stanford Center for Assessment, Learning and Equity

2003; Turner et al., 2002), respect (Miller & Murdock, 2007; Murdock et al., 2001; Patrick et al., 2001, 2003), and promoting interaction among students (Patrick et al., 2001). These results were found across studies using a variety of methods, including hierarchical linear modeling (Miller & Murdock, 2007; Stornes et al., 2008), classroom observation (Patrick et al., 2001, 2003), and discourse analysis (Turner et al., 2002). In a series of four studies, two models were investigated, the mastery goal structures and the 4 dimensions of classroom social climate (teacher academic support, teacher emotional support, classroom mutual respect, and classroom interaction). The 'fit' for both models was good, although the first order model (mastery goal structures) was a better fit accounting for between 92% and 67% of the variance in measures used.

Payton, J., Weissberg, R., Durlak, J., Dymnicki, A., Taylor, R., Schellinger, K., & Pachan, M. (2008). ***The positive impact of social and emotional learning for kindergarten to eighth-grade students: Findings from three scientific reviews*** **(Technical Report). Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.**

This report summarizes three large-scale reviews of research on the impact of the social and emotional learning (SEL) program on racially- ethnically, socio-economically and geographically (rural, urban and suburban) diverse elementary and middle school aged students. Findings indicated that the SEL programs yielded multiple benefits and were effective in both school settings and after school settings for both students with and without behavioral and emotional problems across 317 studies involving 324,303 children. Improvements are noted and include connection to school, positive social behavior and academic performance across grades K-8. The time invested in holistic programming, rather than a detracting from, increases students' performance standardized tests and grades.

Pianta, R., Hamre, B., & Allen, J. (2012). Teacher-student relationships and engagement: Conceptualizing, measuring, and improving the capacity of classroom interactions. In S.L. Christensen, et al. (Eds.)*, Handbook of research on student engagement* **(pp. 365-386). New York, NY: Springer Science + Business Media**.

Classrooms are complex social systems, and student-teacher relationships and interaction are also complex, multicomponent systems. We posit that the nature and quality of relationship interactions between teachers and students are fundamental to understanding student engagement, can be assessed through standardized observation methods, and can be changed by providing teachers knowledge about developmental processes relevant for classroom interactions and personalized feedback/support about their interactive behaviors and cues. When these supports are provided to teachers' interactions, student engagement increases. A focus on theoretical and empirical links between interactions and engagement and present an approach to intervention that is designed to increase the quality of interractions and subsequent student engagement, learning and development.

© 2015 Stanford Center for Assessment, Learning and Equity

Rimm-Kaufman, S., Larsen, R., Baroody, A., Curby, T., Ko, M., Thomas, J., Merritt, E., Abry, T., & DeCoster, J. (2014). Efficacy of the responsive classroom approach: Results from a 3-year, longitudinal randomized controlled trial. ***American Education Research Journal, 51(3), 567-603.*** **doi:10.3102/0002831214523821**

This randomized controlled field trial examined the efficacy of the *Responsive Classroom* (*RC*) approach on student achievement. Schools (*n* = 24) were randomized into intervention and control conditions; 2,904 children were studied from end of second to fifth grade. Students at schools assigned to the *RC* condition did not outperform students at schools assigned to the control condition in math or reading achievement. Use of *RC* practices mediated the relation between treatment assignment and improved math and reading achievement. Effect sizes (ES) were calculated as standardized coefficients. ES relations between use of *RC* practices and achievement were .26 for math and .30 for reading. The *RC* practices and math achievement relation was greater for students with low initial math achievement (ES = .89). Results emphasize fidelity of implementation.

Stipek, D. J., Feiler, R., Byler, P., Ryan, R., Milburn, S., & Salmon, J. M. (1998). Good beginnings: What difference does the program make in preparing young children for school? ***Journal of Applied Developmental Psychology, 19*****(1), 41-66. doi: 10:1016/S0193-3973(99)80027-6**

Cognitive competencies and motivation were assessed at the beginning and the end of the year for 228 preschoolers and kindergartners and again at the end of the next year (kindergarten or first grade) for 93 of the participants. Participants were in classrooms classified as either emphasizing basic skills in a less positive social climate or de-emphasizing basic skills in a more positive social climate. Cognitive competencies were assessed with two achievement tests (one for letters/reading and another for numbers/math) and six subscales from the McCarthy test. Motivation (perceptions of competence, attitudes toward school, anxiety, affect, risk taking, expectations for success, independence, and persistence) was assessed in an experimental setting and by observing children's behavior in their classroom. The results showed primarily negative effects on both cognitive and motivation outcomes of preschool programs emphasizing basic skills using structured, teacher directed approaches in a relatively negative social climate. For kindergartners both positive and negative achievement and motivation outcomes were associated with both types of classrooms.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 7: Engaging Students in Learning

Guiding Question: *How does the candidate actively engage students in developing content knowledge and understanding?*

Rubric Concept: *Students are engaged in meaningful learning tasks that develop and deepen specific-subject matter content understanding. The candidate links students' prior learning with new learning and new learning with students' personal, cultural, or community assets.*

Appleton, J., Christenson, S., & Furlong, M. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45*(5), 369-386. doi: 10.1002/pits.20303

Research supports the connection between engagement, achievement, and school behavior across levels of economic and social advantage and disadvantage. Despite increasing interest and scientific findings, a number of interrelated conceptual and methodological issues must be addressed to advance this construct, particularly for designing data-supported interventions that promote school completion and enhanced educational outcomes for all students. Of particular concern is the need to (a) develop consensus on the name of the construct, (b) identify reliable measures of the dimensions of the construct, and (c) complete the construct validation studies needed to move research and intervention forward.

Engle, R. A. (2012). The productive disciplinary engagement framework: Origins, key concepts, and developments. In Y. Dai (Ed.), *Design research on learning and thinking in educational settings: Enhancing intellectual growth and functioning* (pp. 161-200). New York, NY: Routledge.

Finn, J., & Zimmer, K. (2012). Student engagement: What is it? Why does it matter? In S. L. Christenson, A. Richley, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97-131). New York, NY: Springer Science+Business Media.

This chapter considers the relationships of student engagement with academic achievement, graduating from high school, and entering postsecondary schooling. Older and newer models of engagement are described and critiqued, and four common components are identified. Research on the relationship of each component with academic outcomes is reviewed. The main themes are that engagement is essential for learning, that engagement is multifaceted with behavioral and psychological components, that engagement and disengagement are developmental and

© 2015 Stanford Center for Assessment, Learning and Equity

occur over a period of years, and that student engagement can be modified through school policies and practices to improve the prognoses of students at risk. The chapter concludes with a 13-year longitudinal study that shows the relationships of academic achievement, behavioral and affective engagement, and dropping out of high school.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59-109. doi: 10.3102/00346543074001059

The concept of school engagement has attracted increasing attention as representing a possible antidote to declining academic motivation and achievement. Engagement is presumed to be malleable, responsive to contextual features, and amenable to environmental change. Researchers describe behavioral, emotional, and cognitive engagement and recommended studying engagement as a multifaceted construct. This article reviews definitions, measures, precursors and outcomes of engagement; discusses limitations in the existing research; and suggests improvements.

Gresalfi, M., Martin, T., Hand, V., & Greeno, J. (2009). Constructing competence: An analysis of student participation in the activity systems of mathematics classrooms. *Educational Studies in Mathematics, 70*(1), 49-70. doi:10.1007/s10649-008-9141-5

This paper investigates the construction of systems of competence in two middle school mathematics classrooms. Drawing on analyses of discourse from videotaped classroom sessions, this paper documents the ways that agency and accountability were distributed in the classrooms through interactions between the teachers and students as they worked on mathematical content. In doing so, we problematize the assumption that competencies are simply attributes of individuals that can be externally defined. Instead, we propose a concept of individual competence as an attribute of a person's participation in an activity system such as a classroom. In this perspective, what counts as “competent” gets constructed in particular classrooms, and can therefore look very different from setting to setting. The implications of the ways that competence can be defined are discussed in terms of future research and equitable learning outcomes.

Lawson, M., & Lawson, H. (2013). New conceptual frameworks for student engagement, research, policy, and practice. *Review of Educational Research, 83*(3), 432-479. doi: 10.3102/0034654313480891

Student engagement has a history of research and practice that is a priority goal of postsecondary completion and advanced competence in today’s race-to-the top policy environment. Students must be engaged longer and more deeply. Given the salient need for students attending schools located in segregated, high-poverty neighborhoods and isolated rural

© 2015 Stanford Center for Assessment, Learning and Equity

communities "it is imperative that student engagement is conceptualized beyond the dominant conception of affective/emotional, behavioral, and cognitive indicators. Students' prior knowledge, experiences, home and community interests, that is sociocultural and sociological features also need to be included in the practice of engagement.

Marks, H. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal, 37*(1), 153-184. doi: 10.3102/00028312037001153

Although student engagement with the intellectual work of school is important to students' achievement and to their social and cognitive development, studies over a span of two decades have documented low levels of engagement, particularly in the classroom. Examining several theoretical perspectives that attempt to explain engagement through comprehensive frameworks, this study evaluates the effect on engagement of school reform initiatives that are consistent with the theories. The study also investigates whether patterns exist in students' engagement, whether the patterns are consistent across grade levels, and whether class subject matter (mathematics or social studies) differentially affects engagement. The sample includes 3,669 students representing 143 social studies and mathematics classrooms in a nationally selected sample of 24 restructuring elementary, middle, and high schools. Because of the nature of the nested data (students nested within classrooms nested within schools), the analysis is conducted using hierarchical linear modeling in its three-level application (HLM3L). The results are generally consistent across grade levels. Together with classroom subject matter, personal background effects substantially influence engagement, thus social support for learning contributes substantially to student engagement.

Moll, L.C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, *31*(2), 132-141. doi:10.1080/00405849209543534

Newmann, F. M., Wehlage, G. G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11-39). New York, NY: Teachers College Press.

A significant body of research has shown that students from different social and cultural backgrounds look at schooling in vastly different ways (see Eckert, 1989; Farrell, 1990; Weis, 1999). Research on how schools might enhance student engagement in academic work is lacking, but scholarship in psychology, sociology, and studies of schooling suggest the importance of several factors. Engagement in academic work is construed to result largely from three broad factors: students' underlying need for competence, the extent to which students experience membership in the school, and the authenticity, or 'real world' learning for the work they are asked to complete. One study was based on hypothesizing that challenging students to use their

© 2015 Stanford Center for Assessment, Learning and Equity

minds would enhance engagement, another project studied how to increase higher- order thinking in social studies. A third project developed a model of authentic instructional discourse that included criteria for the kind of writing, reading, and talking most likely to promote engagement and achievement. A final project studied high school mainly from the students' perspective to learn how engagement and achievement might be influenced by student experiences in four non-instructional settings namely, the family, peer group, extracurricular activity, and part-time work.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*(4), 571-581. doi: 10.1037/0022-0663.85.4.571

On the basis of a new model of motivation, we examined the effects of three dimensions of teacher *(n* = 14) behavior (involvement, structure, and autonomy support) on 144 children's (Grades 3-5) behavioral and emotional engagement across a school year. Correlational and path analyses revealed that teacher involvement was central to children's experiences in the classroom and that teacher provision of both autonomy support and optimal structure predicted children's motivation across the school year. Reciprocal effects of student motivation on teacher behavior were also found. Students who showed higher initial behavioral engagement received subsequently more of all three teacher behaviors. These findings suggest that students who are behaviorally disengaged receive teacher responses that should further undermine their motivation. The importance of the student-teacher relationship, especially interpersonal involvement, in optimizing student motivation is highlighted.

Webb, M. N., Franke, M., Ing, M., Wong, J., Fernandez, C., Shin, N., & Turrou, A. (2014). Engaging with others' mathematical ideas: Interrelationships among student participation, teachers' instructional practices, and learning. *International Journal of Educational Research, 63*, 79-93. doi: 10.1016/j.ijer.2013.02.001

This paper explores the relationship between student participation in classroom conversations, teacher practices, and student learning in elementary school mathematics classrooms. Six teachers and 111 children aged 8-10 participated in the study. Students and teachers were videotaped as they discussed how to solve mathematical problems during whole-class and small-group discussions. The results show that the level of student engagement with each other's ideas and the incidence of students providing detailed explanations of their problem-solving strategies were positively related to student achievement. While teachers used a variety of instructional practices to encourage students to attend to and engage with each other's thinking, how teachers followed up on their initial moves was important for whether students engaged with others' ideas at a high level.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 8: Deepening Student Learning

Guiding Question: *How does the candidate elicit student responses to promote thinking and to develop an understanding of subject-specific elements of content?*

Rubric Construct: *Candidate elicits and builds on students' responses to promote thinking and develop content understanding while facilitating student interactions toward self- evaluation*.

Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the classroom assessment scoring system--secondary. *School Psychology Review, 42*(1), 76-97.

Research was conducted with a 'research to practice' or 'applied practice' approach for inquiry. Classrooms observations and data gathering frame and investigate ways of improving the quality of teacher-student interactions within the classroom" if a solid understanding of the nature of effective teaching for adolescents is integrated in the instructional approach. Multilevel modeling techniques were used with a sample of 643 students enrolled in 37 secondary school classrooms to predict future student achievement (controlling for baseline achievement) from observed teacher interactions with students in the classroom, coded using the Classroom Assessment Scoring System--Secondary. Classrooms characterized by a positive emotional climate, with sensitivity to adolescent needs and perspectives, use of diverse and engaging instructional learning formats, and a focus on analysis and problem solving was associated with higher levels of student achievement. Effects of higher quality teacher student interactions were greatest in classrooms with fewer students. Implications for teacher performance assessment and teacher effects on achievement are discussed.

Cazden, C. (2001). Classroom discourse and student learning. In *Classroom discourse: The language of teaching and learning* (pp. 60-80). Portsmouth, NH: Heinemann.

Chin, C., & Osbourne, J. (2008). Students' questions: A potential resource for teaching and learning science. Studies in Science Education, 44(1), 1-39. doi: 10.1080/03057260701828101

Students' questions can play an important role in structuring learning and guiding teacher planning. Questions can give teachers insight into students' interests, prior knowledge, and misconceptions, giving the teacher an opportunity to use these to structure the classroom

© 2015 Stanford Center for Assessment, Learning and Equity

curriculum. The paper begins by highlighting the importance and role of students' questions from the perspectives of both the learner and the teacher. It then reviews the empirical research on students' questions, with a focus on four areas: (1) the nature and types of these questions; (2) the effects of teaching students questioning skills; (3) the relationship between students' questions and selected variables; and (4) teachers' responses to, and students' perceptions of, students' questions. Following this, some issues and implications of students' questions for classroom instruction are discussed. The paper concludes by suggesting several areas for future research that have significant value for student learning.

Gamoran, A., & Nystrand, M. (1992). Taking students seriously. Newmann, F. F., Wehlage, G. G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), ***Student engagement and achievement in American secondary schools*** **(pp. 11-39). New York, NY: Teachers College Press.**

When the work of responding to teachers' questions is more authentic, students can actually influence the course of the conversation and engagement is promoted when students are taken seriously. In a research study conducted with the teaching of literature in 9th grade, the occurrence of high-quality discourse is examined. The frequency of discourse occurrences is compared in class situations (large versus small classes, high-ability versus low-ability groups) and it seems to enhance students' engagement, and enhance their understanding of literature (p. 41). These findings suggest that the reason authenticity had positive effects in honors classes and negative effects in remedial classes is that honors teachers more often asked authentic questions about literature, which was, after all, the subject of the test. Our results do not show that authentic questions have no effect in low-ability classes; nor did we find that low-track teachers ask fewer authentic questions. Instead, we discovered that the kind of authentic questions asked in low-ability classes failed to pay off for literature achievement.

Jennings, L., & Mills, H. (2009). Constructing a discourse of inquiry: Findings from a five-year ethnography at one elementary school. ***Teachers College Record, 111*****(7), 1583-1618.**

Inquiry based instruction offers one approach for actively involving students in meaningful learning activity and this study examines how examines how inquiry-based dialogue not only supports academic learning but also supports social learning as students and teachers negotiate, share ideas, collaborate, and problem-solve together. The processes and practices that make up this discourse of inquiry and the function of teacher talk in supporting academic and social learning and agency among students are examined. Findings indicate that a discourse of inquiry is made up of six interacting practices of inquiry constructed by teachers and students across classrooms. This discourse of inquiry integrates academic and social practices that position inquiry as (1) dynamic and dialogic, (2) attentive, probing, and thoughtful, (3) agentive and socially responsible, (4) relational and compassionate, (5) reflective and reflexive, and (6) valuing multiple and interdisciplinary perspectives. The second section makes visible how these practices of inquiry were co-constructed through transcripts of classroom discourse drawn from both data

© 2015 Stanford Center for Assessment, Learning and Equity

sets that centered on discussions of life science. Although teachers and students alike took multiple roles and responsibilities through inquiry, the teacher's discourse was critical in supporting and extending student learning.

Kelly, G. J. (2007). Discourse in science classrooms. In S. Abell & N. Lederman (Eds.), ***Handbook of research on science education*** **(pp. 443-469*).* Mahwah, NJ: Erlbaum.**

Khishfe, R., & Abd-El-Khalick, F. (2002). Influence of explicit and reflective versus implicit inquiry-oriented instruction on sixth graders' views of nature of science. ***Journal of Research in Science Teaching*****,** ***39*****(7), 551-578. doi: 10.1002/tea.10036**

This study investigated the influence of an explicit and reflective inquiry-oriented compared with an implicit inquiry-oriented instructional approach on sixth graders' understandings of nature of science (NOS). The study emphasized the tentative, empirical, inferential, and imaginative and creative NOS. Participants were 62 sixth-grade students in two intact groups. The intervention or explicit group was engaged in inquiry activities followed by reflective discussions of the target NOS aspects. The comparison or implicit group was engaged in the same inquiry activities. However, these latter activities included no explicit references to or discussion of any NOS aspects. Engagement time was balanced for both groups. An open-ended questionnaire in conjunction with semi-structured interviews was used to assess participants' NOS views before and at the conclusion of the intervention, which spanned 2.5 months. Before the intervention, the majority of participants in both groups held naive views of the target NOS aspects. The views of the implicit group participants were not different at the conclusion of the study. By comparison, substantially more participants in the explicit group articulated more informed views of one or more of the target NOS aspects. Thus, an explicit and reflective inquiry-oriented approach was more effective than an implicit inquiry-oriented approach in promoting participants' NOS conceptions. These results do not support the intuitively appealing assumption that students would automatically learn about NOS through engagement in science- based inquiry activities. Developing informed conceptions of NOS is a cognitive instructional outcome that requires an explicit and reflective instructional approach.

Loucks-Horsley, S., & Olson, S. (Eds.). (2000). ***Inquiry and the National Science Education Standards: A guide for teaching and learning*****. Washington, DC: National Academies Press.**

© 2015 Stanford Center for Assessment, Learning and Equity

Marx, R., Blumenfeld, P., Krajcik, J., Fishman, B., Soloway, E., Geier, R., & Tali Tal, R. (2004). Inquiry-based science in the middle grades: Assessment of learning in urban systemic reform. *Journal of Research in Science Teaching*, *41*(10), 1063-1080. doi:10.1002/tea.20039

Science education standards established by American Association for the Advancement of Science (AAAS) and the National Research Council (NRC) urge less emphasis on memorizing scientific facts and more emphasis on students investigating the everyday world and developing deep understanding from their inquiries. These approaches to instruction challenge teachers and students, particularly urban students who often have additional challenges related to poverty. We report data on student learning spanning 3 years from a science education reform collaboration with the Detroit Public Schools. Data were collected from nearly 8,000 students who participated in inquiry-based and technology-infused curriculum units that were collaboratively developed by district personnel and staff from the University of Michigan as part of a larger, district-wide systemic reform effort in science education. The results show statistically significant increases on curriculum-based test scores for each year of participation. Moreover, the strength of the effects grew over the years, as evidenced by increasing effect size estimates across the years. The findings indicate that students who historically are low achievers in science can succeed in standards-based, inquiry science when curriculum is carefully developed and aligned with professional development and district policies

Michaels, S., O'Connor, C., & Resnick, L.B. (2008). Deliberative discourse idealized and realized: Accountable talk in the classroom and civic life. *Studies in Philosophy and Education, 27*(4), 283-297. doi: 10.1007/s11217-007-9071-1

Classroom discussion practices that can lead to reasoned participation by all students are presented and described by the authors. Their research emphasizes the careful orchestration of talk and tasks in academic learning. Parallels are drawn to the philosophical work on deliberative discourse and the fundamental goal of equipping all students to participate in academically productive talk. These practices, termed Accountable TalkSM, emphasize the forms and norms of discourse that support and promote equity and access to rigorous academic learning. They have been shown to result in academic achievement for diverse populations of students. The authors outline Accountable Talk as encompassing three broad dimensions: one, accountability to the learning community, in which participants listen to and build their contributions in response to those of others; two, accountability to accepted standards of reasoning, talk that emphasizes logical connections and the drawing of reasonable conclusions; and, three, accountability to knowledge, talk that is based explicitly on facts, written texts, or other public information. With more than fifteen years research into Accountable Talk applications across a wide range of classrooms and grade levels, the authors detail the challenges and limitations of contexts in which discourse norms are not shared by all members of the classroom community.

© 2015 Stanford Center for Assessment, Learning and Equity

Nystrand, M. (2006). Research on the role of classroom discourse as it affects reading comprehension. *Research in the Teaching of English, 40*(4), 392-412.

In the current research climate favoring rigorous experimental studies of instructional scripts using randomly chosen treatment and control groups, education and literacy researchers and policy makers will do well to take stock of their current research base and assess critical issue in this new context. This review of research on classroom discourse as it affects reading comprehension begins by examining 150 years of research on classroom discourse, and then findings and insights teaching literacy through discourse processes and reading comprehension. Recent sociocultural and dialogic research supports claims that classroom discourse, including small group work and whole class discussion, works as an epistemic environment (versus script) for literacy development. New studies examine situated classroom talk in relation to educational outcomes and cultural categories that transcend the classroom. Instruction approaches presented include: discussion based envisionments of literature (Langer, 2001), instructional integration of writing, reading, and talk (Nystrand, Gamoran, & Carbonaro, 2001), and collaborative reasoning (Chinn, Anderson, & Waggoner, 2001; Reznitskaya & Anderson, 2002). Dialogically organized instruction involves fewer teacher questions and more conversational turns than recitations, as students as teachers and students make their contributions and their understandings evolve during class interactions. Open-ended discussion and the exchange of ideas are at the core of the dialogic classroom.

Peterson, D., & Taylor, B. (2012). Using higher-order questioning to accelerate students' growth in reading. *The Reading Teacher, 65*(5), 295-304. doi:10.1002/TRTR.01045

Many states are considering how they can demonstrate the "value added" for the instruction provided by individual teachers, programs, and schools. This highlights the need for effective, highly qualified teachers of reading who provide instruction that is challenging and rigorous for all their students while accelerating students' growth (Darling-Hammond, 2004; Taylor, Raphael, & Au, 2010). Fortunately, 40 years of research on effective teaching of reading has provided the education community with a great deal of knowledge about how to address the complexities and challenges of teaching a diverse student population to read (Taylor, Pressley, & Pearson, 2002). This article describes how teachers working with culturally and linguistically diverse students changed their reading instruction to include more higher-level talk and writing.

Resnick, L. (2010). Nested learning systems for the thinking curriculum. *Educational Researcher, 39*(3), 183-197. doi: 10.3102/0013189X10364671

The 21st century will require knowledge and skill well beyond the basic levels of reading and arithmetic that American schools know how to produce more or less reliably. Delivering a "thinking curriculum" to all American students requires major reform in the ways schools and districts organize their work. The transformation of the institution of schooling that will be

© 2015 Stanford Center for Assessment, Learning and Equity

needed to make this aspirational goal a real achievement is daunting. This article examines cognitive science, systems engineering, and social science concepts that are pointing toward a new foundation for policies and practices that may radically improve the proportion of students who can achieve true 21st-century skills.

Stein, M. K., Engle, R. A., Smith, M. S., & Hughes, E. K. (2008). Orchestrating productive mathematical discussions: Five practices for helping teachers move beyond show and tell. *Mathematical Thinking and Learning, 10*(4), 313-340. doi: 10.1080/10986060802229675

Teachers who attempt to use inquiry-based, student-centered instructional tasks face challenges that go beyond identifying well-designed tasks and setting them up appropriately in the classroom. Because solution paths are usually not specified for these kinds of tasks, students tend to approach them in unique and sometimes unanticipated ways. Teachers must not only strive to understand how students are making sense of the task but also begin to align students' disparate ideas and approaches with canonical understandings about the nature of mathematics. Research suggests that this is difficult for most teachers (Ball, 1993, 2001; Leinhardt & Steele, 2005; Schoenfeld, 1998; Sherin, 2002). In this article, we present a pedagogical model that specifies five key practices teachers can learn to use student responses to such tasks more effectively in discussions: anticipating, monitoring, selecting, sequencing, and making connections between student responses. We first define each practice, showing how a typical discussion based on a cognitively challenging task could be improved through their use. We then explain how the five practices embody current theory about how to support students' productive disciplinary engagement. Finally, we close by discussing how these practices can make discussion-based pedagogy manageable for more teachers.

Turner, J., Meyer, D., Midgley, C., & Patrick, H. (2003). Teacher discourse and sixth graders' reported affect and achievement behaviors in two high-mastery/high-performance mathematics classrooms. *The Elementary School Journal, 103*(4), 357-382. doi: 10.1086/499731

This study examined the relation between the nature of teacher discourse and 34 sixth-grade students' reports of affect and behavior in 2 mathematics classrooms students perceived as emphasizing both mastery and performance goals. Classrooms were observed and teacher discourse was audio recorded and transcribed for the first 2 days of the school year, later in the fall and then in spring. The focus was to assess classroom motivational context and then during a unit on factoring and during a unit on geometry. Students filled out surveys. Findings suggested that supportive instructional discourse that focused on student understanding characterized both classrooms and was associated with student reports of self-regulation and positive coping (approach behaviors). However, the 2 classrooms differed in teacher discourse that supported student autonomy and motivation. These differences appeared to be reflected in student reports of self-handicapping (avoidance behavior) and negative affect following failure. Students in the

© 2015 Stanford Center for Assessment, Learning and Equity

classroom in which there was constant and explicit support for autonomy and intrinsic motivation, positive affect, and collaboration reported less negative affect and self-handicapping. Students in the classroom in which there was less supportive motivational discourse reported more negative affect and self-handicapping. Implications include how features of the classroom context, such as the motivational support provided through instructional practices, might be related to student outcomes in high-mastery/high- performance classrooms.

Webb, N., Franke, M., Ing, M., Wong, J., Fernandez, C., Shin, N., & Turrou, A. (2014). Engaging with others' mathematical ideas: Interrelationships among student participation, teachers' instructional practices, and learning. *International Journal of Educational Research, 63*, 79-93. doi: 10.1016/j.ijer.2013.02.001

This paper explores the relationship between student participation in classroom conversations, teacher practices, and student learning in elementary school mathematics classrooms. Six teachers and 111 children aged 8-10 participated in the study. Students and teachers were videotaped as they discussed how to solve mathematical problems during whole-class and small-group discussions. The results show that the level of student engagement with each other's ideas and the incidence of students providing detailed explanations of their problem-solving strategies were positively related to student achievement. While teachers used a variety of instructional practices to encourage students to attend to and engage with each other's thinking, how teachers followed up on their initial moves was important for whether students engaged with others' ideas at a high level.

Rubric 9: Subject-Specific Pedagogy

Guiding Question: *How does the candidate use subject-specific instructional strategies and materials to help students develop understanding of content?*

Rubric Construct: *Candidate uses core or signature subject-specific strategies to develop and deepen student understanding and knowledge.*

Ball, D., Thames, M., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389-407. doi: 10.1177/0022487108324554

This article reports the authors' efforts to develop a practice-based theory of content knowledge for teaching built on Shulman's (1986) notion of pedagogical content knowledge. As the concept of pedagogical content knowledge caught on, it was in need of theoretical development, analytic

© 2015 Stanford Center for Assessment, Learning and Equity

clarification, and empirical testing. The purpose of the study was to investigate the nature of professionally oriented subject matter knowledge in mathematics by studying actual mathematics teaching and identifying mathematical knowledge for teaching based on analyses of the mathematical problems that arise in teaching. In conjunction, measures of mathematical knowledge for teaching were developed. These lines of research indicate at least two empirically discernable subdomains within pedagogical content knowledge (knowledge of content and students and knowledge of content and teaching) and an important subdomain of "pure" content knowledge unique to the work of teaching, specialized content knowledge, which is distinct from the common content knowledge needed by teachers and nonteachers alike. The article concludes with a discussion of the next steps needed to develop a useful theory of content knowledge for teaching.

Bybee, R., Taylor, J., Gardner, A., Van Scotter, P., Carlson-Powell, J., Westbrook, A., & Landes, N. (2006). *The BSCS 5E instructional model: Origins and effectiveness* (Report). Bethesda, MD: National Institutes of Health, Office of Science Education.

Recent research reports, such as *How People Learn: Brain, Mind, Experience, and School* (Bransford, Brown & Cocking, 2000) and its companion, *How Students Learn: Science in the Classroom* (Donovan & Bransford, 2005), have confirmed what educators have asserted for many years: The sustained use of an effective, research-based instructional model can help students learn fundamental concepts in science and other domains. If we accept that premise, then an instructional model must be effective, supported with relevant research and it must be implemented consistently and widely to have the desired effect on teaching and learning. This report summarizes historical instructional models including Dewey (1916), a comparison of the Science Curriculum Improvement Study (SCIS) program and a rationale and empirical support for the current BSCS (Biological Sciences Curriculum Study) 5E Instructional Model.

Campbell, P. F., Nishio, M., Smith, T. M., Clark, L. M., Conant, D. L., Rust, A. H., DePiper, J.N., Frank, T.J., Griffin, M.J., & Choi, Y. (2014). The relationship between teachers' mathematical content and pedagogical knowledge, teachers' perceptions, and student achievement. *Journal for Research in Mathematics Education*, *45*(4), 419-459.

This study of early-career teachers identified a significant relationship between upper-elementary teachers' mathematical content knowledge and their students' mathematics achievement, after controlling for student- and teacher-level characteristics. Further, the mathematical content and pedagogical knowledge of middle- grades teachers were each directly and positively related to their students' mathematics achievement, with and without teacher-level controls. Significant interactions emerged between teachers' perceptions and knowledge influencing student achievement. Teachers' claimed awareness of their students' dispositions toward mathematics interacted with upper-elementary teachers' content knowledge; middle-grades teachers' beliefs regarding modeling mathematical solutions and

© 2015 Stanford Center for Assessment, Learning and Equity

organizing instruction to support incremental mastery of skills interacted with both content and pedagogical knowledge. Findings provide evidence of the relevance of teacher knowledge and perceptions for teacher preparation and professional development programs.

De La Paz, S., Felton, M., Monte-Sano, C., Croninger, R., Jackson, C., Deogracias, J. S., & Hoffman, B.P. (2014). Developing historical reading and writing with adolescent readers: Effects on student learning. *Theory & Research in Social Education*, *42*(2), 228-274. doi: 10.1080/00933104.2014.908754

In this study, the effects of a disciplinary reading and writing curriculum intervention with professional development are shared. We share our instructional approach and provide writing outcomes for struggling adolescent readers who read at or below basic proficiency levels, as well as writing outcomes for proficient and advanced readers. Findings indicate significant and meaningful growth of about 0.5 of 1 standard deviation in students' abilities to write historical arguments and in the length of their essays for all participants, including struggling readers. Our study also considers teacher implementation of the curriculum intervention. We found that teachers who were most faithful to the underlying constructs of our curriculum intervention also made successful adaptations of the lesson materials.

Fogo, B. (2014). Core practices for teaching history: The results of a Delphi panel survey. *Theory & Research in Social Education*, *42*(2), 151-196. doi: 10.1080/00933104.2014.902781

Recent education literature and research has focused on identifying effective core teaching practices to inform and help shape teacher education and professional development. Although a rich literature on the teaching and learning of history has continued to develop over the past decade, core practice research has largely overlooked history–social studies and focused primarily on math, English-language arts, and science. This article takes a step toward identifying and defining core history teaching practices. It presents and discusses the findings from a Delphi panel survey of 26 expert history educators—teachers, teacher educators, and educational researchers—focused on building consensus around a set of core teaching practices for secondary history education.

Grossman, P., Schoenfeld, A., & Lee, C. (2005). Teaching subject matter. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 201-231). San Francisco, CA: Jossey-Bass.

Hashweh, M. Z. (2005). Teacher pedagogical constructions: A reconfiguration of pedagogical content knowledge. *Teachers and Teaching: Theory and Practice*, *11*(3), 273-292. doi: 10.1080/13450600500105502

© 2015 Stanford Center for Assessment, Learning and Equity

A brief review of the history of pedagogical content knowledge reveals various definitions and conceptualizations of the construct, as well as some conceptual problems. A new conceptualization—teacher pedagogical constructions—is offered to address some of the problems associated with PCK. Seven assertions that comprise the new conceptualization are presented, explained and defended. These are: (1) PCK represents personal and private knowledge; (2) PCK is a collection of basic units called teacher pedagogical constructions; (3) teacher pedagogical constructions result mainly from planning, but also from the interactive and post-active phases of teaching; (4) pedagogical constructions result from an inventive process that is influenced by the interaction of knowledge and beliefs from different categories; (5) edagogical constructions constitute both a generalized event-based and a story-based kind of memory; (6) pedagogical constructions are topic specific; and (7) pedagogical constructions are (or should ideally be) labeled in multiple interesting ways that connect them to other categories and subcategories of teacher knowledge and beliefs. The proposed definition results from a reconceptualization of the nature of PCK as originally proposed, taking the results of major later studies and conceptualizations of PCK into consideration, appropriating new ideas about the structure of memory, and undertaking a reanalysis and presentation of data from a previous study. The article calls for viewing PCK as neither a subcategory of subject matter (subject matter knowledge for teaching) nor as a general generic form of knowledge. It presents a view of PCK as a collection of teacher professional constructions, as a form of knowledge that preserves the planning and wisdom of practice that the teacher acquires when repeatedly teaching a certain topic. Viewing PCK as a collection of TPCs, more precisely defining it, clarifying its relations to other knowledge and beliefs entities, and speculating about its development should facilitate future investigations of PCK.

Hiebert, J., & Grouws, D.A. (2007). The effects of classroom mathematics teaching on students' learning. In F.K. Lester, Jr. (Ed.), ***Second handbook of research on mathematics teaching and learning: A project of the National Council of Teachers of Mathematics*** **(pp. 371-404). Charlotte, NC: Information Age Publishing.**

Hill, H., Blunk, M., Charalambous, C., Lewis, J., Phelps, G., Sleep, L., & Ball, D. (2008). Mathematical knowledge for teaching and the mathematical quality of instruction: An exploratory study. ***Cognition and Instruction, 26*****(4), 430-511. doi: 10.1080/07370000802177235**

This study illuminates claims that teachers' mathematical knowledge plays an important role in their teaching of this subject matter. In particular, we focus on teachers' mathematical knowledge for teaching (MKT), which includes both the mathematical knowledge that is common to individuals working in diverse professions and the mathematical knowledge that is specialized to teaching. We use a series of five case studies and associated quantitative data to detail how MKT is associated with the mathematical quality of instruction. Although there is a significant, strong, and positive association between levels of MKT and the mathematical quality

© 2015 Stanford Center for Assessment, Learning and Equity

of instruction, we also find that there are a number of important factors that mediate this relationship, either supporting or hindering teachers' use of knowledge in practice.

Lederman, N. G. (1992). Students' and teachers' conceptions of the nature of science: A review of the research. *Journal of Research in Science Teaching*, *29*(4), 331-359. doi: 10.1002/tea.3660290404

The development of adequate student conceptions of the nature of science has been a perennial objective of science instruction regardless of the currently advocated pedagogical or curricular emphases. Consequently, it has been an area of prolific research characterized by several parallel, but distinct, lines of investigation. Although research related to students' and teachers' conceptions of the nature of science has been conducted for approximately 40 years, a comprehensive review of the empirical literature (both quantitative and qualitative) has yet to be presented. The overall purpose of this review is to help clarify what has been learned and to elucidate the basic assumptions and logic which have guided earlier research efforts. Ultimately, recommendations related to both methodology and the focus of future research are offered.

Monte-Sano, C., De La Paz, S., & Felton, M. (2014). Implementing a disciplinary-literacy curriculum for US history: Learning from expert middle school teachers in diverse classrooms. *Journal of Curriculum Studies*, *46*(4), 540-575. doi: 10.1080/00220272.2014.904444

In recent years, educators in the USA have emphasized disciplinary literacy as an essential path forward in cultivating adolescents' understanding of subject matter in tandem with literacy practices. Yet, this agenda poses challenges to teachers who have been tasked with its implementation. Here, we examine two expert US history teachers' efforts to implement curriculum that integrates reading, writing and thinking in history with academically diverse eighth graders. We conduct qualitative analyses of teacher observations and interviews as well as student work. This analysis provides insight into several issues that emerge in efforts to teach disciplinary literacy in history classrooms: the nuances of teachers' use of curriculum materials created by people other than themselves, teachers' appropriation and adaptation of curriculum materials and teachers' understanding of curriculum materials and disciplinary literacy goals. We find that teachers' knowledge of the discipline and attention to students' ideas allowed them to skillfully adapt the curriculum to better meet students' needs and push students' thinking. Orienting teachers toward disciplinary learning, ensuring a foundational understanding of their discipline and providing teachers with tools to teach disciplinary literacy are important steps to help students meet the demands of the disciplinary literacy agenda.

National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel.* Washington, DC: U.S. Department of Education.

© 2015 Stanford Center for Assessment, Learning and Equity

Retrieved from http://www2.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC: National Institutes of Health. Retrieved from https://www.nichd.nih.gov/publications/pages/pubs_details.aspx?from=&pubs_id=88

Reisman, A. (2012). Reading like a historian: A document-based history curriculum intervention in urban high schools. *Cognition & Instruction*, *30*(1), 86-112. doi: 10.1080/07370008.2011.634081

Enthusiasm about the instructional potential of primary sources dates to the late nineteenth century and has been echoed recently in the work of literacy experts, historians, and educational psychologists. Yet, no extended intervention study has been undertaken to test the effectiveness of primary source instruction in real history classrooms. This study, with 236 11th- grade students in five San Francisco high schools, represented the first extended curriculum intervention in disciplinary reading in an urban district. The Reading Like a Historian (RLH) curriculum constituted a radical departure from traditional textbook-driven instruction by using a new activity structure, the "Document-Based Lesson," in which students used background knowledge to interrogate, and then reconcile, historical accounts from multiple texts. A quasi-experiment control design measured the effects of a 6-month intervention on four dimensions: (a)students' historical thinking; (b) their ability to transfer historical thinking strategies to contemporary issues; (c) their mastery of factual knowledge; and (d) their growth in general reading comprehension. MANCOVA analysis yielded significant main effects for the treatment condition on all four outcome measures. This study has implications for both adolescent literacy instruction and history teaching at the middle- and high-school levels.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi: 10.3102/0013189X015002004

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

van Driel, J. H., Beijaard, D., & Verloop, N. (2001). Professional development and reform in science education: The role of teachers' practical knowledge. *Journal of Research in Science Teaching*, *38*(2), 137-158. doi: 10.1002/1098-2736(200102)38:2<137::AID-TEA1001>3.0.CO;2-U

In this article, professional development in the context of the current reforms in science education is discussed from the perspective of developing teachers' practical knowledge. It is

© 2015 Stanford Center for Assessment, Learning and Equity

argued that reform efforts in the past have often been unsuccessful because they failed to take teachers' existing knowledge, beliefs, and attitudes into account. Teachers' practical knowledge is conceptualized as action-oriented and person-bound. As it is constructed by teachers in the context of their work, practical knowledge integrates experiential knowledge, formal knowledge, and personal beliefs. To capture this complex type of knowledge, multi-method designs are necessary. On the basis of a literature review, it is concluded that long-term professional development programs are needed to achieve lasting changes in teachers' practical knowledge. In particular, the following strategies are potentially powerful: (a) learning in networks, (b) peer coaching, (c) collaborative action research, and (d) the use of cases. In any case, it is recommended that teachers' practical knowledge be investigated at the start of a reform project, and that changes in this knowledge be monitored throughout the project. In that way, the reform project may benefit from teachers' expertise. Moreover, this makes it possible to adjust the reform so as to enhance the chances of a successful implementation.

Wineburg, S. S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology*, *83*(1), 73-87.

History teachers are frequently urged to use primary sources in their classrooms. Yet little research exists to guide them, for history has been virtually ignored by researchers interested in cognition and instruction. The present study explored how people evaluate primary and secondary sources when considering questions of historical evidence. A group of working historians and high school seniors "thought aloud" as they reviewed a series of written and pictorial documents about the Battle of Lexington. Differences were found in how each group reasoned about historical evidence. It is suggested that these differences are due in part to beliefs that frame the act of historical inquiry. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Rubric 10: Analyzing Teaching Effectiveness

Guiding Question: *How does the candidate use evidence to evaluate and change teaching practice to meet students' varied learning needs?*

Rubric Concept: *Candidate examines the impact of teaching on learning. Changes in practices are justified with evidence to better address learners' needs, and are connected to research and/or theory.*

© 2015 Stanford Center for Assessment, Learning and Equity

Calderhead, J. (1989). Reflective teaching and teacher education. *Teaching and Teacher Education*, *5*(1), 43-51. doi: 10.1016/0742-051X(89)90018-8

The origins of the "reflective teaching" concept are explored. It is suggested that the term has been interpreted and defined in numerous ways, with contrasting implications for the design of teacher education programs. It is argued that the concept requires further examination in the light of empirical research on teaching and how teachers learn to teach, and that existing research on teacher cognitions, teachers' knowledge, and the context of teachers' learning has potential to extend our understanding of the role of reflection in teacher education.

Gallimore, R., Ermeling, B. A., Saunders, W. M., & Goldenberg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *The Elementary School Journal*, *109*(5), 537-553. doi: 10.1086/597001

A 5-year prospective, quasi-experimental investigation demonstrated that grade-level teams in 9 Title 1 schools using an inquiry-focused protocol to solve instructional problems significantly increased achievement. Teachers applying the inquiry protocol shifted attribution of improved student performance to their teaching rather than external causes. This shift was achieved by focusing on an academic problem long enough to develop an instructional solution. Seeing causal connections fosters acquisition of key teaching skills and knowledge, such as identifying student needs, formulating instructional plans, and using evidence to refine instruction. These outcomes are more likely when teams are teaching similar content, led by a trained peer-facilitator, using an inquiry-focused protocol, and have stable settings in which to engage in continuous improvement.

Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, *58*(1), 47-61. doi: 10.1177/0022487106295726

The authors propose a framework for teacher preparation programs that aims to help prospective teachers learn how to teach from studying teaching. The framework is motivated by their interest in defining a set of competencies that provide a deliberate, systematic path to becoming an effective teacher over time. The framework is composed of four skills, rooted in the daily activity of teaching, that when deployed deliberately and systematically, constitute a process of creating and testing hypotheses about cause-effect relationships between teaching and learning during classroom lessons. In spite of the challenges of acquiring these skills, the authors argue that the framework outlines a more realistic and more promising set of beginning teacher competencies than those of traditional programs designed to produce graduates with expert teaching strategies.

© 2015 Stanford Center for Assessment, Learning and Equity

Hiebert, J., Morris, A. K., & Glass, B. (2003). Learning to learn to teach: An "experiment" model for teaching and teacher preparation in mathematics. ***Journal of Mathematics Teacher Education*****, *6*(3), 201-222. doi: 10.1023/A:1025162108648**

This paper describes a model for generating and accumulating knowledge for both teaching and teacher education. The model is applied first to prepare prospective teachers to learn to teach mathematics when they enter the classroom. The concept of treating lessons as experiments is used to explicate the intentional, rigorous, and systematic process of learning to teach through studying one's own practice. The concept of planning teaching experiences so that others can learn from one's experience is used to put into practice the notion of contributing to a shared professional knowledge base for teaching mathematics. The same model is then applied to the work of improving teacher preparation programs in mathematics. Parallels are drawn between the concepts emphasized for prospective teachers and those that are employed by instructors who study and improve teacher preparation experiences. In this way, parallels also are seen in the processes used to generate an accumulating knowledge base for teaching and for teacher education.

Jay, J., & Johnson, K. (2002). Capturing complexity: A typology of reflective practice for teacher education. ***Teaching and Teacher Education, 18*****, 73-85. doi: 10.1016/S0742-051X(01)00051-8**

Reflection has become an integral part of teacher education, yet its elusive boundaries make it difficult to define and teach. Examining the various facets of reflection with respect to teaching clarifies the concept, making it more accessible to pre-service teachers learning to reflect on their practice. This article explores those facets and provides a typology designed to guide teacher educators in teaching reflection to pre-service teachers.

Kazemi, E., & Franke, M. L. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. ***Journal of Mathematics Teacher Education*****, *7*(3), 203-235. doi:10.1023/B:JMTE.0000033084.26326.19**

The study describes teachers' collective work in which they developed deeper understanding of their own students' mathematical thinking. Teachers at one school met in monthly workgroups throughout the year. Prior to each workgroup, they posed a similar mathematical problem to their students. The workgroup discussions centered on the student work those problems generated. This study draws on a *transformation of participation* perspective to address the questions: What do teachers learn through collective examination of student work? How is teacher learning evident in shifts in participation in discussions centered on student work? The analyses account for the learning of the group by documenting key shifts in teachers' participation across the year. The first shift in participation occurred when teachers as a group learned to attend to the details of children's thinking. A second shift in participation occurred as

© 2015 Stanford Center for Assessment, Learning and Equity

teachers began to develop possible instructional trajectories in mathematics. We focus our discussion on the significance of the use of student work and a transformation of participation view in analyzing the learning trajectory of teachers as a group.

Korthagen, F., & Vasalos, A. (2005). Levels in reflection: core reflection as a means to enhance professional growth. *Teachers and Teaching: Theory and Practice*, *11*(1), 47–71. doi: 10.1080/1354060042000337093

Reflection is currently a key concept in teacher education. The reflection process is often described in terms of a cyclical model. In the present article, we explain how such a model can be used for supporting student teachers' reflection on practical situations they are confronted with, and on their behavior, skills and beliefs in such situations. In some cases, however, more fundamental issues appear to influence teachers' practical functioning. For example, their self-concept can have a decisive influence on the way they function, or they may do what is expected of them, and yet not feel truly involved. In such cases, a more fundamental form of reflection is needed, which in this article we refer to as 'core reflection'. The focus on core reflection concurs with the recent emphasis in psychology on attending to people's strengths rather than their deficiencies.

Marcos, J., & Tillema, H. (2006). Studying studies on teacher reflection and action: An appraisal of research contributions. *Educational Research Review*, *1*(2), 112-132. doi: 10.1016/j.edurev.2006.08.003

For decades a substantial body of research on teacher reflection and action has been conducted. This research contains a wealth of information on teachers' thinking about their daily work in classrooms. But what do these studies tell us about the linkage between thought and action in actual teaching? How do they contribute to our understanding, or do they, in the very selection of their methods, 'tell only half the story'? To address these concerns, we have engaged in a critical appraisal to learn about the scope and limitations of research contributions and identify criteria that may shed light on exactly what aspects of teacher learning and development are being studied. This appraisal uses an analytic framework to position the various studies that have been conducted. From our analysis, which focuses on the validity criterion of closeness between type of research question and data collection methods, we conclude that the research would profit from a set of more detailed criteria to address some of the limitations inherent in approaches to studying teacher reflection and action.

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Stigler, J. W., & Hiebert, J. (2009). *The teaching gap: Best ideas from the world's teachers for improving education in the classroom*. New York, NY: Simon and Schuster.

© 2015 Stanford Center for Assessment, Learning and Equity

Valli, L. (Ed.). (1992). *Reflective teacher education: Cases and critiques*. Albany, NY: SUNY Press.

Ward, J., & Mc Cotter, S. (2004). Reflection as a visible outcome for preservice teachers. *Teaching and Teacher Education, 20*(3), 243-257. doi: 10.1016/j.tate.2004.02.004

As the standards movement progresses, efforts to encourage reflection by student teachers are often undermined. In this piece, we analyze exemplars of student teacher reflection coming from two very different approaches to outcomes-based teacher preparation. We use these exemplars to develop a rubric that illuminates the dimensions and qualities of reflection. This rubric helps clarify how meaningful reflection and an emphasis on learning are not incompatible if the focus is placed on the process of learning, rather than on outcomes alone. Finally, we contend that engagement in the process of reflection and reflection on the moral enterprise of teaching can be considered as important outcomes in their own right.

Zeichner, K.M. (1994). Research on teacher thinking and different views of reflective practice in teaching and teacher education. In I. Carlgren, G. Handal, & S. Vaage (Eds.), *Teachers' minds and actions: Research on teachers' thinking and practice* (pp. 9-27). Washington, DC: The Falmer Press.

Zeichner, K. M., & Liston, D. P. (1987). Teaching student teachers to reflect. *Harvard Educational Review*, *57*(1), 23-49.

Conventional teacher education programs follow an apprenticeship model and, in so doing, aspire to provide student teachers with pedagogical skills and techniques derived from a preexisting body of knowledge. In this contribution to *HER*'s special series, "Teachers, Teaching, and Teacher Education," Kenneth M. Zeichner and Daniel P. Liston argue that the conventional approach inhibits the self-directed growth of student teachers and thereby fails to promote their full professional development. Illustrating an alternative model, the authors describe and assess the elementary student teaching program at the University of Wisconsin, Madison — a program oriented toward the goals of reflective teaching, greater teacher autonomy, and increasing democratic participation in systems of educational governance.

Zeichner, K. M., & Liston, D. P. (2013). *Reflective teaching: An introduction (2e)*. New York, NY: Routledge.

© 2015 Stanford Center for Assessment, Learning and Equity

Task 3: Assessment

Rubric 11: Analysis of Student Learning

Guiding Question: *How does the candidate analyze evidence of student learning?*

Rubric Concept: *Candidate's analysis of student learning focuses on strengths and needs of students supported by evidence from the work samples and a summary of performance across the class. Analysis includes differences and/or patterns of whole class learning.*

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, *21*(1), 5-31. doi: 10.1007/s11092-008- 9068-5

Whilst many definitions of formative assessment have been offered, there is no clear rationale to define and delimit it within broader theories of pedagogy. This paper aims to offer such a rationale, within a framework that can also unify the diverse set of practices that have been described as formative. The analysis is used to relate formative assessment both to other pedagogic initiatives, notably cognitive acceleration and dynamic assessment, and to some of the existing literature on models of self-regulated learning and on classroom discourse. This framework should indicate potentially fruitful lines for further enquiry, whilst at the same time opening up new ways of helping teachers to implement formative practices more effectively.

Black, P., Wilson, M., & Yao, S. Y. (2011). Road maps for learning: A guide to the navigation of learning progressions. *Measurement: Interdisciplinary Research & Perspectives*, *9*(2-3), 71-123. doi: 10.1080/15366367.2011.591654

The overall aim of this article is to analyze the relationships between the roles of assessment in pedagogy, the interactions between curriculum assessment and pedagogy, and the study of pupils' progression in learning. It is argued that well-grounded evidence of pupils' progressions in learning is crucial to the work of teachers, so that a method is needed which will enable the production of such evidence in relation to the learning strategy of any teacher. The argument starts by proposing a rationale for understanding the central roles of assessments in pedagogy and in particular the relationships between their use for formative and summative purposes. This is then related to a more general discussion of the links between curriculum, assessment and pedagogy, which serves to highlight the importance of models of progression. The next step is to

© 2015 Stanford Center for Assessment, Learning and Equity

consider how assessment evidence of pupils' learning can be analyzed in two ways: By ordering the respondents in terms of overall scores, and by ordering individual items in terms of their difficulty. A method of relating these two in the BEAR assessment system is then explained. This method is then illustrated by a general review of the literature on the study of the atomic-molecular model, leading to detailed consideration of progression in the understanding of melting and evaporation. Results obtained, from a test of eleven items about these two topics, attempted by 665 grade 8 pupils in 11 schools in San Francisco, are then used to illustrate the method of analysis and the nature of the results that it can produce. A final section considers the educational and assessment issues about learning progressions, pedagogy and assessment that we see as being informed by the ideas and practices outlined in the article.

Bloom, B. S., Hastings, J. T., & Madaus, G. (1971). *Handbook on formative and summative evaluation of student learning*. New York, NY: McGraw-Hill.

The art and science of evaluating student learning is presented in detail to assist the classroom teacher in its application and the consequent improvement of both the teaching and learning processes. Part 1, in four sections (Education and Evaluation, Using Evaluation for Instructional Decisions, Evaluation Techniques for Cognitive and Affective Objectives and Evaluation Systems), considers exhaustively the evaluation problems teachers are likely to encounter, and provides a framework and techniques for test construction. In Part 2, individual chapters apply the principles enunciated in Part 1 to evaluation in eleven major subject disciplines and levels ranging from preschool education to art education, from secondary school mathematics to industrial education. Illustrations of objectives, testing techniques, and sample test items in the particular subject area are presented, as are tables of specifications attempting to include the relevant content and behaviors. These chapters, each by a specialist in the field, are intended to help teachers find ways of using evaluation to improve learning in their own specific area. Although this handbook was designed especially for teachers, it is also useful for students in teacher-training and graduate programs, curriculum specialists and students interested in test construction. The entire book is related to Bloom's earlier work on the Taxonomy of Educational Objectives. Each of the 23 chapters is supported by a comprehensive reference list.

Darling-Hammond, L. (2008). Teacher learning that supports student learning. In B. Presseisen (Ed.), *Teaching for intelligence* (2nd ed.) (pp. 91-100). Thousand Oaks, CA: Corwin Press.

© 2015 Stanford Center for Assessment, Learning and Equity

Gearhart, M., Nagashima, S., Pfotenhauer, J., Clark, S., Schwab, C., Vendlinski, T., Osmundson, E., Herman, J., & Bernbaum, D. J. (2006). Developing expertise with classroom assessment in K–12 science: Learning to interpret student work. Interim findings from a 2-year study. *Educational Assessment*, *11*(3-4), 237-263. doi: 10.1080/10627197.2006.9652990

This article reports findings on growth in 3 science teachers' expertise with interpretation of student work over 1 year of participation in a program. The program was designed to strengthen classroom assessment. Using a framework for classroom assessment expertise, we analyze patterns of teacher learning, and the roles of the professional program and the quality of the assessments provided with teachers' instructional materials.

Harlen, W. (2005). Teachers' summative practices and assessment for learning--tensions and synergies. *The Curriculum Journal*, *16*(2), 207-223. doi: 10.1080/09585170500136093

This article concerns the use of assessment for learning (formative assessment) and assessment of learning (summative assessment), and how one can affect the other in either positive or negative ways. It makes a case for greater use of teachers' judgments in summative assessment, the reasons for this being found in the research that is reviewed in the first sections of the article. This research, concerning the impact of summative assessment, particularly high-stakes testing and examinations, on students' motivation for learning and on teachers and the curriculum, reveals some seriously detrimental effects. Suggestions for changes that would reduce the negative effects include making greater use of teachers' summative assessment. However, this raises other issues, about the reliability and validity of teachers' assessment. Research on ways of improving the dependability of teachers' summative assessment suggests actions that would equally support more effective use of assessment to help learning. The later sections of the article address the issues and opportunities relating to the possibility of assessment that serves both formative and summative purposes, with examples of what this means in practice, leading to the conclusion that the distinction between formative and summative purposes of assessment should be maintained, while assessment systems should be planned and implemented to enable evidence of students' ongoing learning to be used for both purposes.

Herman, J. L. (1992). What research tells us about good assessment. *Educational Leadership*, *49*(8), 74-78.

Herman, J.L., Aschbacher, P.R., & Winters, L. (1992). *A practical guide to alternative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Guidance is offered on the creation and use of alternative assessment; and a process model is presented that links assessment with curriculum and instruction, based on contemporary

© 2015 Stanford Center for Assessment, Learning and Equity

theories of learning and cognition. The introductory chapter, "Rethinking Assessment," provides background on the purposes of assessment and the need for new alternatives, plus an overview of key assessment development issues. Linking assessment and instruction is the focus of Chapter 2, which also reviews current trends in assessment. Chapter 3 considers determining the purpose of the assessment, and Chapter 4 reviews selecting assessment tasks and matching them to student outcomes. Setting the criteria for judging student performance is discussed in Chapter 5. Chapter 6 reviews the steps necessary to ensure reliable scoring. Chapter 7 makes the important point that assessment is not an end in itself, but rather a tool for decision- making. In this context, reliability and validity of assessments are discussed. There are 26 figures illustrating the discussion.

Linn, R. L., Baker, E. L., & Dunbar, S. B. (1991). Complex, performance-based assessment: Expectations and validation criteria. *Educational researcher*, *20*(8), 15-21. doi: 10.3102/0013189X020008015

In recent years there has been an increasing emphasis on assessment results, as well as increasing concern about the nature of the most widely used forms of student assessment and uses that are made of the results. These conflicting forces have helped create a burgeoning interest in alternative forms of assessments, particularly complex, performance-based assessments. It is argued that there is a need to rethink the criteria by which the quality of educational assessments are judged, and a set of criteria that are sensitive to some of the expectations for performance-based assessments is proposed.

Popham, W. J. (2009). Assessment literacy for teachers: Faddish or fundamental? *Theory into Practice*, *48*(1), 4-11. doi: 10.1080/00405840802577536

In recent years, increasing numbers of professional development programs have dealt with assessment literacy for teachers and/or administrators. Is assessment literacy merely a fashionable focus for today's professional developers or, in contrast, should it be regarded as a significant area of professional development interest for many years to come? After dividing educators' measurement-related concerns into either classroom assessments or accountability assessments, it is argued that educators' inadequate knowledge in either of these arenas can cripple the quality of education. Assessment literacy is seen, therefore, as a sine qua non for today's competent educator. As such, assessment literacy must be a pivotal content area for current and future staff development endeavors. Thirteen must-understand topics are set forth for consideration by those who design and deliver assessment literacy programs. Until preservice teacher education programs begin producing assessment literate teachers, professional developers must continue to rectify this omission in educators' professional capabilities.

© 2015 Stanford Center for Assessment, Learning and Equity

Shepard, L., Hammerness, K., Darling Hammond, L., Rust, F., Snowden, J. B. , Gorden, E., Gutierrez, C., & Pacheco, A. (2005). Assessment. In L. Darling-Hammond & J. Bransford (Eds.), ***Preparing teachers for a changing world: What teachers should learn and be able to do*** **(pp. 275-326). San Francisco, CA: Jossey-Bass/John Wiley.**

Wiliam, D. (2011). What is assessment for learning*? Studies in Educational Evaluation, 37*, 3-14. doi:10.1016/j.stueduc.2011.03.001

The idea that assessment is intrinsic to effective instruction is traced from early experiments in the individualization of learning through the work of Benjamin Bloom to reviews of the impact of feedback on learners in classrooms. While many of these reviews detailed the adverse impact of assessment on learning, they also indicated that under certain conditions assessment had considerable potential to enhance learning. It is shown that understanding the impact that assessment has on learning requires a broader focus than the feedback intervention itself, particularly the learner's responses to the feedback, and the learning milieu in which the feedback operates. Different definitions of the terms ''formative assessment'' and ''assessment for learning'' are discussed, and subsumed within a broad definition that focuses on the extent to which instructional decisions are supported by evidence. The paper concludes by exploring some of the consequences of this definition for classroom practice.

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. ***Assessment in Education: Principles, Policy and Practice*****,** ***11*****(1), 49-65. doi: 10.1080/0969594042000208994**

While it is generally acknowledged that increased use of formative assessment (or assessment for learning) leads to higher quality learning, it is often claimed that the pressure in schools to improve the results achieved by students in externally-set tests and examinations precludes its use. This paper reports on the achievement of secondary school students who worked in classrooms where teachers made time to develop formative assessment strategies. A total of 24 teachers (2 science and 2 mathematics teachers, in each of six schools in two LEAs) were supported over a six-month period in exploring and planning their approach to formative assessment, and then, beginning in September 1999, the teachers put these plans into action with selected classes. In order to compute effect sizes, a measure of prior attainment and at least one comparison group was established for each class (typically either an equivalent class taught in the previous year by the same teacher, or a parallel class taught by another teacher). The mean effect size in favor of the intervention was 0.32.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 12: Providing Feedback to Guide Learning

Guiding Question: *What type of feedback does the candidate provide to focus students?*

Rubric Concept: *Candidate provides feedback that is accurate and focuses on errors and/or strengths related to specific learning.*

Black, P., & Wiliam, D. (1998a). Assessment and classroom learning. *Assessment in Education: Principles, Policy and Practice*, *5*(1), 7-74. doi: 10.1080/0969595980050102

This article is a review of the literature on classroom formative assessment. Several studies show firm evidence that innovations designed to strengthen the frequent feedback that students receive about their learning yield substantial learning gains. The perceptions of students and their role in self-assessment are considered alongside analysis of the strategies used by teachers and the formative strategies incorporated in such systemic approaches as mastery learning. There follows a more detailed and theoretical analysis of the nature of feedback, which provides a basis for a discussion of the development of theoretical models for formative assessment and of the prospects for the improvement of practice.

Black, P., & Wiliam, D. (1998b). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139–148. doi: 10.1177/003172171009200119

In this article, the authors discuss the use of formative assessment to improve classroom performance and to promote student achievement. The article asserts that little attention is paid to classroom performance when reform initiatives are introduced. The authors argue that the responsibility for classroom performance should not be left to the teacher alone, and assistance should come from the administration and educational programs. The article proposes the use of formative assessment so that teachers know what the students are learning and how they are learning.

Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, *1*(1), 3-31. Retrieved from http://www2.glos.ac.uk/offload/tli/lets/lathe/issue1/articles/simpson.pdf

Much evaluation of teaching focuses on what teachers do in class. This article focuses on the evaluation of assessment arrangements and the way they affect student learning out of class. It is assumed that assessment has an overwhelming influence on what, how and how much students study. The article proposes a set of 'conditions under which assessment supports

© 2015 Stanford Center for Assessment, Learning and Equity

learning' and justifies these with reference to theory, empirical evidence and practical experience. These conditions are offered as a framework for teachers to review the effectiveness of their own assessment practice.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi: 10.3102/003465430298487

Feedback is one of the most powerful influences on learning and achievement, but this impact can be either positive or negative. Its power is frequently mentioned in articles about learning and teaching, but surprisingly few recent studies have systematically investigated its meaning. This article provides a conceptual analysis of feedback and reviews the evidence related to its impact on learning and achievement. This evidence shows that although feedback is among the major influences, the type of feedback and the way it is given can be differentially effective. A model of feedback is then proposed that identifies the particular properties and circumstances that make it effective, and some typically thorny issues are discussed, including the timing of feedback and the effects of positive and negative feedback. Finally, this analysis is used to suggest ways in which feedback can be used to enhance its effectiveness in classrooms.

Hattie, J. (2013). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement* (pp. 173-178*)*. New York, NY: Routledge.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*(2), 254-284. doi: 10.1037/0033-909.119.2.254

Since the beginning of the century, feedback interventions (FIs) produced negative--but largely ignored--effects on performance. A meta-analysis (607 effect sizes; 23,663 observations) suggests that FIs improved performance on average (*d* = .41) but that over one-third of the FIs decreased performance. This finding cannot be explained by sampling error, feedback sign, or existing theories. The authors proposed a preliminary FI theory (FIT) and tested it with moderator analyses. The central assumption of FIT is that FIs change the locus of attention among 3 general and hierarchically organized levels of control: task learning, task motivation, and meta-tasks (including self-related) processes. The results suggest that FI effectiveness decreases as attention moves up the hierarchy closer to the self and away from the task. These findings are further moderated by task characteristics that are still poorly understood.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119-144. doi: 10.1007/BF00117714

The theory of formative assessment outlined in this article is relevant to a broad spectrum of learning outcomes in a wide variety of subjects. Specifically, it applies wherever multiple criteria

© 2015 Stanford Center for Assessment, Learning and Equity

are used in making judgments about the quality of student responses. The theory has less relevance for outcomes in which student responses may be assessed simply as correct or incorrect. Feedback is defined in a particular way to highlight its function in formative assessment. This definition differs in several significant respects from that traditionally found in educational research. Three conditions for effective feedback are then identified and their implications discussed. A key premise is that for students to be able to improve, they must develop the capacity to monitor the quality of their own work during actual production. This in turn requires that students possess an appreciation of what high quality work is, that they have the evaluative skill necessary for them to compare with some objectivity the quality of what they are producing in relation to the higher standard, and that they develop a store of tactics or moves which can be drawn upon to modify their own work. It is argued that these skills can be developed by providing direct authentic evaluative experience for students. Instructional systems which do not make explicit provision for the acquisition of evaluative expertise are deficient, because they set up artificial but potentially removable performance ceilings for students.

Shepard, L. A. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, *63*(3), 66-70.

Formative assessment and instructional scaffolding are essentially the same thing. Formative assessment uses insights about a learner's current understandings to alter the course of instruction and thus support the development of greater competence. Scaffolding refers to supports that teachers provide the learner during problem solving--in the form of reminders, hints, and encouragement--to ensure successful completion of a task. Four strategies illustrate the strong connection between formative assessment and research on learning: eliciting prior knowledge, providing effective feedback, teaching for transfer of knowledge, and encouraging student self-assessment.

Shute, V. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153-189. doi:10.3102/0034654307313795

This article reviews the corpus of research on feedback, with a focus on formative feedback—defined as information communicated to the learner that is intended to modify his or her thinking or behavior to improve learning. According to researchers, formative feedback should be nonevaluative, supportive, timely, and specific. Formative feedback is usually presented as information to a learner in response to some action on the learner's part. It comes in a variety of types (e.g., verification of response accuracy, explanation of the correct answer, hints, worked examples) and can be administered at various times during the learning process (e.g., immediately following an answer, after some time has elapsed). Finally, several variables have been shown to interact with formative feedback's success at promoting learning (e.g., individual

© 2015 Stanford Center for Assessment, Learning and Equity

characteristics of the learner and aspects of the task). All of these issues are discussed. This review concludes with guidelines for generating formative feedback.

Vollmeyer, R., & Rheinberg, F. (2005). A surprising effect of feedback on learning. *Learning and Instruction*, *15*(6), 589-602. doi:10.1016/j.learninstruc.2005.08.001

As meta-analyses demonstrate feedback effects on performance, our study examined possible mediators. Based on our cognitive–motivational model [Vollmeyer, R., & Rheinberg, F. (1998). Motivationale Einflüsse auf Erwerb und Anwendung von Wissen in einem computersimulierten System [Motivational influences on the acquisition and application of knowledge in a simulated system]. *Zeitschrift für Pädagogische Psychologie, 12*, 11–23] we examined how feedback changed (1) strategies, and (2) motivation during learning, and by doing so improved (3) final performance. Students (*N* = 211) learned how a dynamic system works and how to reach given goal states for the system. One group received feedback (i.e., knowledge of performance) the other one did not. We expected learners to improve after they received the first feedback. However, we found that learners expecting feedback used better strategies right from the start. Thus, they acquired more knowledge over fewer trials. Although we had also expected effects of feedback on motivation during learning, we could not support this hypothesis.

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, *37*(1), 3-14. doi:10.1016/j.stueduc.2011.03.001

The idea that assessment is intrinsic to effective instruction is traced from early experiments in the individualization of learning through the work of Benjamin Bloom to reviews of the impact of feedback on learners in classrooms. While many of these reviews detailed the adverse impact of assessment on learning, they also indicated that under certain conditions assessment had considerable potential to enhance learning. It is shown that understanding the impact that assessment has on learning requires a broader focus than the feedback intervention itself, particularly the learner's responses to the feedback, and the learning milieu in which the feedback operates. Different definitions of the terms ''formative assessment'' and ''assessment for learning'' are discussed, and subsumed within a broad definition that focuses on the extent to which instructional decisions are supported by evidence. The paper concludes by exploring some of the consequences of this definition for classroom practice.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 13: Student Use of Feedback

Guiding Question: *How does the candidate provide opportunities for focus learners to understand and use the feedback to guide their further learning?*

Rubric Construct: *Candidate explains how s/he will support focus students to use feedback to deepen understandings and skills related to learning objectives.*

Brookhart, S., Moss, C., & Long, B. (2009). Promoting student ownership of learning through high-impact formative assessment practices. *Journal of MultiDisciplinary Evaluation, 6*(12), 52-67.

The most important instructional decisions, those with the greatest influence on student success, are made by learners themselves (Stiggins, 2008). Formative assessment, done well, contributes to student ownership of learning more than any other classroom-based instructional or assessment practice (Bloom, 1984). It is an economical, highly effective, and uniquely flexible method that can improve learning (Leahy, Lyon, Thompson, & Wiliam, 2005). Simply put, the teacher's purpose in formative assessment is to give students the means, motive, and opportunity to take control of their own learning. And, through their involvement in formative assessment, students develop self-efficacy for specific learning and, more generally, they develop skills that contribute to increased self-regulation and self-assessment of learning. In order for students to be meaningfully involved in formative assessment, they must be guided by teachers who hold the beliefs, knowledge and skills that engender active student engagement in the learning process. This paper highlights interim findings from a five-year professional development initiative involving the Armstrong School District, a large, rural school district in Western Pennsylvania, and the Center for Advancing the Study of Teaching and Learning at the Duquesne University School of Education. The initiative rests on the fusion of formative assessment, teacher-student communication, and student ownership of learning. The professional development program employs online modules, peer study groups, classroom walkthroughs, and teacher inquiry into their classroom practices and the beliefs that drive them. The program explores seven formative assessment components: 1) Identifying and Clearly Communicating Learning Targets, 2) Feedback that Feeds Forward, 3) Student Goal- Setting, 4) Student Self-Assessment, 6) Strategic Questioning, and 7) Formative Discourse. All components are linked to specific aspects of student motivation: intrinsic motivation, self- efficacy, self-regulation, goal-setting, and student attributions. The paper describes the impacts of formative assessment on student ownership of learning, student achievement, motivation, and active engagement as well as provides insights into teachers' experiences with student involvement. Findings show that not only have the teachers come to value and promote student ownership of learning using high

© 2015 Stanford Center for Assessment, Learning and Equity

impact formative assessment strategies, but that their efforts have resulted in high student engagement in learning and increased student achievement.

Butler, R., & Nisan, M. (1986). Effects of no feedback, task-related comments, and grades on intrinsic motivation and performance. *Journal of Educational Psychology*, *78*(3), 210-216. doi: 10.1037/0022-0663.78.3.210

Tested the hypothesis that intrinsic motivation would be maintained after receipt of nonthreatening, task-related evaluation and undermined after repeated nonreceipt of feedback or receipt of controlling normative grades. Nine classes comprising 261 6th-grade pupils were randomly assigned to 1 of these 3 feedback conditions and were given 2 interesting tasks, 1 quantitative and 1 qualitative, on 3 sessions over 2 days. The manipulation was applied after Sessions 1 and 2, and no feedback was expected or received after Session 3. Experimental measures consisted of Session 3 performance scores and of the results of a questionnaire, given after Session 3, which tapped interest and patterns of attribution of success and effort. Results confirm the hypothesis and show significant group differences in intrinsic motivation as reflected in both performance and attitudes. It is suggested that intrinsic motivation is not merely a function of collative stimulus properties but depends on the dynamic interaction between the stimulus and the individual (i.e., on the degree to which a task continues to be perceived as challenging and as providing satisfying increments in one's knowledge about one's competence.

Carless, D. (2006). Differing perceptions in the feedback process. *Studies in Higher Education*, *31*(2), 219-233. doi: 10.1080/03075070600572132

Feedback is central to the development of effective learning, yet is comparatively under-researched. This article seeks to examine the notion of written feedback on assignments and argue that this feedback process is more complex than is sometimes acknowledged. The author illustrates the problematic nature of assignment feedback by drawing on a large-scale questionnaire survey conducted across eight universities, and then analyzing the issue in more depth though fine-grained data collected from students in a teacher education institute. The article is framed by the concepts of discourse, power and emotion. It highlights a number of different perceptions of students and tutors towards the assessment, marking and feedback process. The author concludes by arguing that ‘assessment dialogues’ are a way forward to mitigate some of the mistrust or misconceptions that may be unwanted outcomes of the assessment process.

© 2015 Stanford Center for Assessment, Learning and Equity

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(1), 1-6. doi: 10.1080/00098650903267784

Formative assessment can have a powerful impact on student motivation and achievement. This article discusses five key practices that teachers can use to gather important information about student understanding, provide feedback to students, and enable students to set and attain meaningful learning goals. Each of the techniques can enhance student motivation as well as achievement.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi:10.3102/003465430298487

Feedback is one of the most powerful influences on learning and achievement, but this impact can be either positive or negative. Its power is frequently mentioned in articles about learning and teaching, but surprisingly few recent studies have systematically investigated its meaning. This article provides a conceptual analysis of feedback and reviews the evidence related to its impact on learning and achievement. This evidence shows that although feedback is among the major influences, the type of feedback and the way it is given can be differentially effective. A model of feedback is then proposed that identifies the particular properties and circumstances that make it effective, and some typically thorny issues are discussed, including the timing of feedback and the effects of positive and negative feedback. Finally, this analysis is used to suggest ways in which feedback can be used to enhance its effectiveness in classrooms.

Havnes, A., Smith, K., Dysthe, O., & Ludvigsen, K. (2012). Formative assessment and feedback: Making learning visible. *Studies in Educational Evaluation, 38*(1), 21-27. doi: 10.1016/j.stueduc.2012.04.001

The study explores how assessment information is received and attended to. The research is linked to a 2-year intervention project involving six Norwegian upper secondary schools, and with a particular focus on vocational training and the three core subjects: English, Norwegian and Mathematics. Survey data was collected from five schools, including both vocationally and academically oriented education. Other sources of data are focus-group interviews in three of the five schools, involving students, teachers and school leaders. Findings show that there are significant differences in how students and teachers perceive feedback practices. There are also significant differences between boys and girls, as well as within the various school subjects. Students experience more feedback in vocational training than in the more traditional academic subjects.

© 2015 Stanford Center for Assessment, Learning and Equity

Marzano, R. J., Pickering, D., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

Shute, V. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153-189. doi:10.3102/0034654307313795

This article reviews the corpus of research on feedback, with a focus on formative feedback—defined as information communicated to the learner that is intended to modify his or her thinking or behavior to improve learning. According to researchers, formative feedback should be non-evaluative, supportive, timely, and specific. Formative feedback is usually presented as information to a learner in response to some action on the learner's part. It comes in a variety of types (e.g., verification of response accuracy, explanation of the correct answer, hints, worked examples) and can be administered at various times during the learning process (e.g., immediately following an answer, after some time has elapsed). Finally, several variables have been shown to interact with formative feedback's success at promoting learning (e.g., individual characteristics of the learner and aspects of the task). All of these issues are discussed. This review concludes with guidelines for generating formative feedback.

Stiggins, R. (2005). From formative assessment to assessment for learning: A path to success in standards-based schools. *Phi Delta Kapplan, 87*(4), 324-328. Retrieved from http://ati.pearson.com/downloads/fromformat_k0512sti1.pdf

Assessment FOR learning - A third approach to formative assessment contends that access to more frequent evidence of student mastery of state standards gathered using multiple-choice tests and placed in the hands of teachers, while potentially helpful, falls short of tapping the immense potential of formative thinking. The alternative is to use many different assessment methods to provide students, teachers, and parents with a continuing stream of evidence of student progress in mastering the knowledge and skills that underpin or lead up to state standards. This option has been labeled assessment FOR learning. In this approach, students learn about achievement expectations from the beginning of the learning by studying models of strong and weak work. And they don't merely learn about the standards. Rather, they come to see and understand the scaffolding they will be climbing as they approach those standards. Students partner with their teacher to continuously monitor their current level of attainment in relation to agreed-upon expectations so they can set goals for what to learn next and thus play a role in managing their own progress. Students play a special role in communicating evidence of learning to one another, to their teacher, and to their families, and they do so not just after the learning has been completed but all along the journey to success.

© 2015 Stanford Center for Assessment, Learning and Equity

Rubric 14: Analyzing Students' Language Use and Content Learning

Guiding Question: *How does the candidate analyze students' use of language to develop content understanding?*

Rubric Construct: *Candidate explains and provides evidence of students' use of the language function and other language demands (vocabulary, discourse, syntax) to support the development of content understandings.*

Applebee, A. N., Langer, J. A., Nystrand, M., & Gamoran, A. (2003). Discussion-based approaches to developing understanding: Classroom instruction and student performance in middle and high school English. *American Educational Research Journal*, *40*(3), 685-730. doi: 10.3102/00028312040003685

This study examines the relationships between student literacy performance and discussion--based approaches to the development of understanding in 64 middle and high school English classrooms. A series of hierarchical linear models indicated that discussion-based approaches were significantly related to spring performance, controlling for fall performance and other background variables. These approaches were effective across a range of situations and for low-achieving as well as high-achieving students, although interpretations are complicated because instruction is unequally distributed across tracks. Overall, the results suggest that students whose classroom literacy experiences emphasize discussion-based approaches in the context of high academic demands internalize the knowledge and skills necessary to engage in challenging literacy tasks on their own.

Bailey, A. L. (Ed.). (2007). *The language demands of school: Putting academic English to the test*. New Haven, CT: Yale University Press.

Bailey, A. L., & Drummond, K. V. (2006). Who is at risk and why? Teachers' reasons for concern and their understanding and assessment of early literacy. *Educational Assessment*, *11*(3-4), 149-178. doi: 10.1080/10627197.2006.9652988

This study focuses on an issue of recent policy significance—the need to aid teachers in successfully identifying why children struggle to acquire literacy. This study (a) asked K–1 teachers to nominate students that they believed to be at risk for literacy difficulties and to provide reasons for their concern, (b) examined how these reasons relate to teachers' broader conceptions of literacy, and (c) investigated whether teachers' initial reasons and checklist-guided ratings align with concurrently administered standardized assessments. Results revealed that teachers have a wide array of initial concerns for students. There was some discordance

© 2015 Stanford Center for Assessment, Learning and Equity

between teachers' specific reasons for concern and their broader conceptions of early literacy. Comparison of student performance on standardized measures with teacher rationale also revealed discordance. Specific guidelines to teachers on use of a literacy checklist increased concordance between subsequent teacher ratings and standardized measures in some reading-related skills but not others. Implications for the use of multiple sources of evidence for student performance, as well as professional development, are discussed.

Bailey, A. L., & Heritage, H. M. (Eds.). (2008). *Formative assessment for literacy, grades K-6: Building reading and academic language skills across the curriculum*. Thousand Oaks, CA: Corwin Press.

Baumann, J. F., & Graves, M. F. (2010). What is academic vocabulary? *Journal of Adolescent & Adult Literacy*, *54*(1), 4-12. doi: 10.1598/JAAL.54.1.1

The article comments on how the term "academic vocabulary" should be defined. The discussion focuses on the constructs of academic vocabulary with a comparison of various definitions of the term. Topics include typologies used to organize academic vocabulary and procedures used to identify academic vocabulary for teaching purposes. An example is given of how a content teacher could use a categorized academic vocabulary for instruction. Sources of academic words are recommended that can be used by instructors of adolescents. Domain- specific and general academic vocabularies are discussed. Studies on categorizing academic vocabulary and selecting words to teach are noted.

Bunch, G. C. (2013). Pedagogical language knowledge: Preparing mainstream teachers for English learners in the new standards era. *Review of Research in Education*, *37*(1), 298-341. doi: 10.3102/0091732X12461772

Sooner or later, as schools move to implement the new Common Core and other forthcoming standards, almost every teacher in the United States will face the challenge of how to support students from homes where English is not the dominant language in meeting subject-matter academic expectations that require increasingly demanding uses of language and literacy in English. In this chapter, I review research that provides potential insights on how “mainstream” teachers might be prepared for responding to this challenge, both in preservice teacher preparation programs and throughout their careers. I argue that efforts to prepare teachers for working with English learners (ELs) to engage with increasing language and literacy expectations across the curriculum requires development of *pedagogical language knowledge* (Galguera, 2011)—not to “teach English” in the way that most mainstream teachers may initially conceive of (and resist) the notion, but rather to purposefully enact opportunities for the development of language and literacy in and through teaching the core curricular content, understandings, and activities that teachers are responsible for (and, hopefully, excited about) teaching in the first place. I review recent literature that presents various approaches to what this knowledge might

© 2015 Stanford Center for Assessment, Learning and Equity

entail and how teacher preparation and development initiatives might go about fostering it. I conclude by proposing that, in an age of increasing linguistic demands associated with new academic expectations, building teachers' understanding of language as *action* (van Lier & Walqui, 2012) could serve as the foundation for preparing them to engage—and support—ELs in both challenging and meaningful academic tasks.

Cazden, C. (2001). Classroom discourse and student learning. In *Classroom Discourse: The Language of Teaching and Learning* (pp. 58-80*).* Portsmouth, NH: Heinemann.

Cazden's seminal work on the study of classroom discourse provides a framework for understanding the language functions of teaching and learning to engage multi-ethnic, multilingual learners. Language patterns during instruction affect the knowledge gained in learning activities. Three areas of classroom discourse investigated are the communication of cognitive activity, and ideas, the establishment and management of the social relationships and the learners' expressions of identity and attitudes in a classroom environment.

Fillmore, L. W., & Snow, C. E. (2000). *What teachers need to know about language*. Washington, DC: Center for Applied Linguistics. Retrieved September 12, 2014, from **http://files.eric.ed.gov/fulltext/ED444379.pdf**

Today's teachers need access to a wide range of information to function in the classroom. They need a thorough understanding of how language figures in education, and for that reason they must receive systematic and intensive preparation in educational linguistics. A thorough grounding in linguistics would support teachers' undertakings overall, and in particular in teaching literacy skills and working with English language learners. If approached coherently, such preparation would also cover many of the desired teacher competencies, relating to skills in assessing children, in individualizing instruction, and in respecting diversity. This paper lays out a rationale for why current and prospective teachers need to know more about language, and what specific sorts of knowledge they need. Requisite knowledge about oral language, oral language used in formal and academic contexts, and written language is discussed. In the final section, courses are suggested that teacher preparation programs should offer to teacher candidates. This course list may also be seen as specifying aspects of an integrated, in-depth professional development program for inservice teachers. A glossary is appended.

Galguera, T. (2011). Participant structures as professional learning tasks and the development of pedagogical language knowledge among preservice teachers. *Teacher Education Quarterly*, *38*(1), 85-106.

English-Language Learners (ELLs, English-Learners, ELs) are a particularly challenging sector of the student population in United States schools. They constitute an increasingly larger presence in most school districts, growing 51 percent in ten years to 5.1 million in 2006. Despite becoming

© 2015 Stanford Center for Assessment, Learning and Equity

more common, schools have yet to figure out ways to meet the needs of these students, who continue to lag behind in most academic achievement measures. Although "English-Language-Learner" is an important demographic category, the designation is problematic as a reference point for teaching practice among teachers and teacher educators. In this article the author argues for a shift in the definition of teaching practice for teachers and teacher educators away from "English learners" toward "language use for academic purposes" as a perspective from which to examine their practice. This self-study is an instance of a teacher educator interested in experiential, hands-on pedagogy to foster critical language awareness among preservice teachers. The author begins by proposing a re-conceptualization of teaching and teacher preparation in terms of learning outcomes, not student types. He argues that "English-Language-Learners" is (a) both too broad and not inclusive enough, (b) likely to elicit views of students as deficient, (c) not conducive to "one-size-fits-all" approaches (Reyes, 1992), and (d) lacking a widely-accepted theory or model to explain the relationship between teaching and learning. He then analyzes his students' developing awareness of academic language after completing two PLTs, one in English, the other in Spanish. After discussing findings, the author closes with conclusions and recommendations regarding academic language use as another form of pedagogical content knowledge.

Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2002). Design and analysis in task-based language assessment. *Language Testing*, *19*(4), 477-496. doi: 10.1191/0265532202lt241oa

In task-based language assessment (TBLA) language use is observed in settings that are more realistic and complex than in discrete skills assessments, and which typically require the integration of topical, social and/or pragmatic knowledge along with knowledge of the formal elements of language. But designing an assessment is not accomplished simply by determining the settings in which performance will be observed. TBLA raises questions of just how to design complex tasks, evaluate students' performances and draw valid conclusions therefrom. This article examines these challenges from the perspective of 'evidence-centered assessment design'. The main building blocks are student, evidence and task models, with tasks to be administered in accordance with an assembly model. We describe these models, show how they are linked and assembled to frame an assessment argument and illustrate points with examples from task-based language assessment.

Nagy, W., & Townsend, D. (2012). Words as tools: Learning academic vocabulary as language acquisition. *Reading Research Quarterly*, *47*(1), 91-108. doi: 10.1002/RRQ.011

There is a growing awareness of the importance of academic vocabulary, and more generally, of academic language proficiency, for students' success in school. There is also a growing body of research on the nature of the demands that academic language places on readers and writers, and on interventions to help students meet these demands. In this review, we discuss the role of

© 2015 Stanford Center for Assessment, Learning and Equity

academic vocabulary within academic language, examine recent research on instruction in academic vocabulary, considering both general academic words and discipline- specific words, and offer our perspective on the current state of this research and recommendations on how to continue inquiry and to improve practice in this area. We use the metaphor of 'words as tools' to reflect our understanding that instruction in academic vocabulary must approach words as means for communicating and thinking about disciplinary content, and must therefore provide students with opportunities to use the instructed words for these purposes as they are learning them.

Ruiz-Primo, M. (2011). Informal formative assessment: The role of instructional dialogues in assessing students' learning. *Studies in Educational Evaluation, 37*(1), 15-24. doi: 10.1016/j.stueduc.2011.04.003

This paper focuses on an unceremonious type of formative assessment – informal formative assessment – in which much of what teachers and students do in the classroom can be described as potential assessments that can provide evidence about the students' level of understanding. More specifically, the paper focuses on assessment conversations, or dialogic interactions or exchanges, which continuously happen in the classroom and that are at the center of informal formative assessment. It is argued that assessment conversations make students' thinking explicit in an unobtrusive manner, and when students' thinking is explicit, it can be examined, questioned, and shaped as an active object of constructive learning. The paper conceptualizes informal formative assessment at the center of effective instructional activities with the use of instructional dialogues as assessment conversations, a typical informal formative assessment practice. The paper then presents a discussion about the evidence on the effect of assessment conversations on student learning. The informal formative assessment strategies and how a teacher chooses to synthesize and analyze the information gathered through them are critical to ensuring students' progress towards learning goals.

Saunders, W., & Goldenberg, C. (2010). Research to guide English language development instruction. In Center for Applied Linguistics (Ed.), *Improving education for English learners: Research-based approaches (*pp. 21-81). Sacramento, CA: California Department of Education Press

The purpose of this chapter is to synthesize existing research that provides direction for English language development (ELD) instruction. Many sources and resources might guide the direction of ELD instruction, including theory, research, ELD standards, practitioner experience, and published programs. This chapter focuses on research, specifically studies and research syntheses that help identify specific guidelines for effective ELD instruction.

© 2015 Stanford Center for Assessment, Learning and Equity

Zwiers, J. (2014). Chapter 9: Building language development into lessons and assessments. ***Building academic language: Meeting Common Core Standards across disciplines, grades 5-12*** **(2nd ed.) (pp. 245-280). San Francisco, CA: Jossey-Bass/John Wiley.**

Rubric 15: Using Assessment to Inform Instruction

Guiding Question: *How does the candidate use the analysis of what students know and are able to do to plan next steps in instruction?*

Rubric Concept: *Candidate plans next steps for instruction that improves student learning and justifies the next steps based on student needs as reflected in performance on an assessment as well as theory/research.*

Duschl, R. A., & Gitomer, D. H. (1997). Strategies and challenges to changing the focus of assessment and instruction in science classrooms. ***Educational Assessment*****,** ***4*****(1), 37-73.**

The improvement of science education in accord with the current science reform agenda requires the development of sophisticated instructional strategies that are grounded in a clear recognition of student understanding. We describe a pedagogical strategy, the assessment conversation, that helps teachers elicit student understanding and then use elicited and diverse student understanding as the instructional basis for achieving conceptual and reasoning goals in the classroom. We then illustrate the potential and challenges of using the assessment conversation through examples that have emerged from Science Education through Portfolio Instruction and Assessment (SEPIA), a project attempting to reform practices of assessment and instruction in middle school science classrooms. We conclude with a discussion of issues facing any substantial reform of science education.

Gallimore, R., Ermeling, B. A., Saunders, W. M., & Goldenberg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. ***The Elementary School Journal*****,** ***109*****(5), 537-553. doi: 10.1086/597001**

A 5-year prospective, quasi-experimental investigation demonstrated that grade-level teams in 9 Title 1 schools using an inquiry-focused protocol to solve instructional problems significantly increased achievement. Teachers applying the inquiry protocol shifted attribution of improved student performance to their teaching rather than external causes. This shift was achieved by focusing on an academic problem long enough to develop an instructional solution. Seeing causal connections fosters acquisition of key teaching skills and knowledge, such as identifying

© 2015 Stanford Center for Assessment, Learning and Equity

student needs, formulating instructional plans, and using evidence to refine instruction. These outcomes are more likely when teams are teaching similar content, led by a trained peer-facilitator, using an inquiry-focused protocol, and have stable settings in which to engage in continuous improvement.

Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J. C. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=12

The purpose of this practice guide is to help K-12 teachers and administrators use student achievement data to make instructional decisions intended to raise student achievement. The panel believes that the responsibility for effective data use lies with district leaders, school administrators, and classroom teachers and has crafted the recommendations accordingly. This guide focuses on how schools can make use of common assessment data to improve teaching and learning. For the purpose of this guide, the panel defined common assessments as those that are administered in a routine, consistent manner by a state, district, or school to measure students' academic achievement. These include: (1) annual statewide accountability tests such as those required by No Child Left Behind; (2) commercially produced tests--including interim assessments, benchmark assessments, or early-grade reading assessments--administered at multiple points throughout the school year to provide feedback on student learning; (3) end-of-course tests administered across schools or districts; and (4) interim tests developed by districts or schools, such as quarterly writing or mathematics prompts, as long as these are administered consistently and routinely to provide information that can be compared across classrooms or schools. This guide includes five recommendations that the panel believes are a priority to implement: (1) Make data part of an ongoing cycle of instructional improvement; (2) Teach students to examine their own data and set learning goals; (3) Establish a clear vision for schoolwide data use; (4) Provide supports that foster a data-driven culture within the school; and (5) Develop and maintain a districtwide data system. A glossary of terms used in the report is included. Appended are: (1) Postscript from the Institute of Education Sciences; (2) About the authors; (3) Disclosure of potential conflicts of interest; and (4) Technical information on the studies. (Contains 7 tables and 2 figures.)

Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, *58*(1), 47-61. doi: 10.1177/0022487106295726

The authors propose a framework for teacher preparation programs that aims to help prospective teachers learn how to teach from studying teaching. The framework is motivated by their interest in defining a set of competencies that provide a deliberate, systematic path to becoming an effective teacher over time. The framework is composed of four skills, rooted in the

© 2015 Stanford Center for Assessment, Learning and Equity

daily activity of teaching, that when deployed deliberately and systematically, constitute a process of creating and testing hypotheses about cause effect relationships between teaching and learning during classroom lessons. In spite of the challenges of acquiring these skills, the authors argue that the framework outlines a more realistic and more promising set of beginning teacher competencies than those of traditional programs designed to produce graduates with expert teaching strategies.

Hiebert, J., Morris, A. K., & Glass, B. (2003). Learning to learn to teach: An "experiment" model for teaching and teacher preparation in mathematics. *Journal of Mathematics Teacher Education*, *6*(3), 201-222. doi: 10.1023/A:1025162108648

This paper describes a model for generating and accumulating knowledge for both teaching and teacher education. The model is applied first to prepare prospective teachers to learn to teach mathematics when they enter the classroom. The concept of treating lessons as experiments is used to explicate the intentional, rigorous, and systematic process of learning to teach through studying one's own practice. The concept of planning teaching experiences so that others can learn from one's experience is used to put into practice the notion of contributing to a shared professional knowledge base for teaching mathematics. The same model is then applied to the work of improving teacher preparation programs in mathematics. Parallels are drawn between the concepts emphasized for prospective teachers and those that are employed by instructors who study and improve teacher preparation experiences. In this way, parallels also are seen in the processes used to generate an accumulating knowledge base for teaching and for teacher education.

Little, J. W., Gearhart, M., Curry, M., & Kafka, J. (2003). Looking at student work for teacher learning, teacher, community and school reform. *Phi Delta Kappan*, *85*(3), 184-192. doi: 10.1177/003172170308500305

There is emerging evidence that some versions of looking at student work yield benefits for teaching and learning. Little et al. describe several projects that have enabled teachers to leave the isolation of their own classrooms, and think together about student work in the broader contexts of school improvement and professional development.

Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist*, *47*(2), 71-85. doi: 10.1080/00461520.2012.667064

Data-driven decision-making has become an essential component of educational practice across all levels, from chief state school officers to classroom teachers, and has received unprecedented attention in terms of policy and financial support. It was included as one of the four pillars in the American Recovery and Reinvestment Act (2009), indicating that federal education officials seek

© 2015 Stanford Center for Assessment, Learning and Equity

to ensure that data and evidence are used to inform policy and practice. This article describes the emergence of data-driven decision making as a topic of interest, some of the challenges to and opportunities for data use, and how the principles of educational psychology can and must be used to inform how educators are using data and the examination of its impact on educational practice.

Popham, W. J. (2003). *Test better, teach better: The instructional role of assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Shepard, L. A. (2001). The role of classroom assessment in teaching and learning. In V. Richardson (Ed.), *Handbook of research on teaching, 4th ed*. (pp. 1066–1101). Washington, DC: American Educational Research Association.

Stecker, P. M., Fuchs, L. S., & Fuchs, D. (2005). Using curriculum-based measurement to improve student achievement: Review of research. *Psychology in the Schools*, *42*(8), 795-819. doi: 10.1002/pits.20113

This review examines the efficacy of curriculum-based measurement (CBM) as an assessment methodology for enhancing student achievement. We describe experimental-contrast studies in reading and mathematics in which teachers used CBM to monitor student progress and to make instructional decisions. Overall, teachers' use of CBM produced significant gains in student achievement; however, several critical variables appeared to be associated with enhanced achievement for students with disabilities: teachers' use of systematic data-based decision rules, skills analysis feedback, and instructional recommendations for making program modifications. In general education, positive effects for CBM were associated with use of class profiles and implementation of peer-assisted learning strategies. Implications for instructional practice and future applications of CBM are described.

Stiggins, R. J., Arter, J. A., Chappuis, J., & Chappuis, S. (2004). *Classroom assessment for student learning: Doing it right—using it well*. Portland, OR: Assessment Training Institute.

Stigler, J. W., & Hiebert, J. (2009). *The teaching gap: Best ideas from the world's teachers for improving education in the classroom*. New York, NY: Simon and Schuster.

Wayman, J. C. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk*, *10*(3), 295-308. doi: 10.1207/s15327671espr1003_5

Accountability mandates such as No Child Left Behind (NCLB) have drawn attention to the practical use of student data for school improvement. Nevertheless, schools may struggle with

© 2015 Stanford Center for Assessment, Learning and Equity

these mandates because student data are often stored in forms that are difficult to access, manipulate, and interpret. Such access barriers additionally preclude the use of data at the classroom level to inform and impact instruction. Fortunately, there are newly available computer technologies that allow efficient organization and access to student data. In addition to allowing easier accountability reporting, these tools allow user-friendly data access at all educational levels, meaning that teachers can use these tools to engage in the informed reflection necessary to improve classroom practice. In this article, I discuss teacher use of these systems, providing insight into the function of these tools and discussing conditions that make these tools of the most service to teachers.

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, *37*(1), 3-14. doi: 10.1016/j.stueduc.2011.03.001

The idea that assessment is intrinsic to effective instruction is traced from early experiments in the individualization of learning through the work of Benjamin Bloom to reviews of the impact of feedback on learners in classrooms. While many of these reviews detailed the adverse impact of assessment on learning, they also indicated that under certain conditions assessment had considerable potential to enhance learning. It is shown that understanding the impact that assessment has on learning requires a broader focus than the feedback intervention itself, particularly the learner's responses to the feedback, and the learning milieu in which the feedback operates. Different definitions of the terms ''formative assessment'' and ''assessment for learning'' are discussed, and subsumed within a broad definition that focuses on the extent to which instructional decisions are supported by evidence. The paper concludes by exploring some of the consequences of this definition for classroom practice.

Wilson, S. (2004). Student assessment as an opportunity to learn in and from one's teaching practice. In M. Wilson (Ed.), *Towards coherence between classroom assessment and accountability, 103rd Yearbook for the National Society for the Study of Education, Part II* (pp. 264–271). Chicago, IL: University of Chicago Press.

© 2015 Stanford Center for Assessment, Learning and Equity

References

Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the classroom assessment scoring system--secondary. ***School Psychology Review, 42*****(1), 76-97.**

Applebee, A. N., Langer, J. A., Nystrand, M., & Gamoran, A. (2003). Discussion-based approaches to developing understanding: Classroom instruction and student performance in middle and high school English. ***American Educational Research Journal*****,** ***40*****(3), 685-730. doi: 10.3102/00028312040003685**

Appleton, J., Christenson, S., & Furlong, M. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. ***Psychology in the Schools, 45*****(5), 369-386. doi: 10.1002/pits.20303**

Bailey, A. L. (Ed.). (2007). ***The language demands of school: Putting academic English to the test*****. New Haven, CT: Yale University Press.**

Bailey, A. L., & Drummond, K. V. (2006). Who is at risk and why? Teachers' reasons for concern and their understanding and assessment of early literacy. ***Educational Assessment*****,** ***11*****(3-4), 149-178. doi: 10.1080/10627197.2006.9652988**

Bailey, A. L., & Heritage, H. M. (Eds.). (2008). ***Formative assessment for literacy, grades K-6: Building reading and academic language skills across the curriculum*****. Thousand Oaks, CA: Corwin Press.**

Ball, A. (2002). Three decades of research on classroom life: Illuminating the classroom communicative lives of America's at-risk students. ***Review of Research in Education, 26*****(1), 71-111. doi: 10.3102/0091732X026001071**

Ball, D., Thames, M., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? ***Journal of Teacher Education, 59*****(5), 389-407. doi: 10.1177/0022487108324554**

Banks, J. A. (1993). Multicultural education: Historical development, dimensions, and practice. ***Review of Research in Education*****, 19(1), 3-49. doi: 10.3102/0091732X019001003**

Banks, J., Cochran-Smith, M., Moll, L., Richert, A., Zeichner, K., LePage, P., Darling- Hammond, L., Duffy, H., & McDonald, M. (2005). Teaching diverse learners. In L. Darling-Hammond & J. Bransford (Eds.), ***Preparing teachers for a changing world: What teachers should learn and be able to do*** **(pp. 232-274). San Francisco, CA: Jossey-Bass.**

© 2015 Stanford Center for Assessment, Learning and Equity

Baumann, J. F., & Graves, M. F. (2010). What is academic vocabulary? *Journal of Adolescent & Adult Literacy*, *54*(1), 4-12. doi: 10.1598/JAAL.54.1.1

Becker, B., & Luthar, S. (2002). Social-emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educational Psychologist*, 37(4), 197-214. doi: 10.1207/S15326985EP3704_1

Beyer, C. J., & Davis, E. A. (2012). Developing preservice elementary teachers' pedagogical design capacity for reform-based curriculum. *Curriculum Inquiry, 42*(3), 386-413. doi: 10.1111/j.1467-873X.2012.00599.x

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy and Practice*, *5*(1), 7-74. doi: 10.1080/0969595980050102

Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139–148. doi: 10.1177/003172171009200119

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, *21*(1), 5-31. doi: 10.1007/s11092-008- 9068-5

Black, P., Wilson, M., & Yao, S. Y. (2011). Road maps for learning: A guide to the navigation of learning progressions. *Measurement: Interdisciplinary Research & Perspectives*, *9*(2-3), 71- 123. doi: 0.1080/15366367.2011.591654

Bloom, B. S., Hastings, J. T., & Madaus, G. (1971). *Handbook on formative and summative evaluation of student learning*. New York, NY: McGraw-Hill.

Bloom, B. S., Madaus, G. F., & Hastings, J. T. (1981). *Evaluation to improve learning*. New York, NY: McGraw-Hill.

Bond, L., Smith, T. W., Baker, W. K., & Hattie, J.A. (2000). *The certification system of the National Board for Professional Teaching Standards: A construct and consequential validity study*. Greensboro, NC: Center for Educational Research and Evaluation.

Bransford, J. D., Brown, A. L., & Cocking, R. R. National Research Council (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academies Press.

Brookhart, S., Moss, C., & Long, B. (2009). Promoting student ownership of learning through high- impact formative assessment practices. *Journal of MultiDisciplinary Evaluation, 6*(12), 52-67.

Brown, J. S., Collins, A., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics (Technical Report 403). Retrieved October 1, 2014, from http://files.eric.ed.gov/fulltext/ED284181.pdf

© 2015 Stanford Center for Assessment, Learning and Equity

Bunch, G. C. (2013). Pedagogical language knowledge: Preparing mainstream teachers for English learners in the new standards era. *Review of Research in Education*, *37*(1), 298-341. doi: 10.3102/0091732X12461772

Butler, R., & Nisan, M. (1986). Effects of no feedback, task-related comments, and grades on intrinsic motivation and performance. *Journal of Educational Psychology*, *78*(3), 210-216. doi: 10.1037/0022-0663.78.3.210

Bybee, R., Taylor, J., Gardner, A., Van Scotter, P., Carlson-Powell, J., Westbrook, A., & Landes, N. (2006). *The BSCS 5E instructional model: Origins and effectiveness* (Report). Bethesda, MD: National Institutes of Health, Office of Science Education.

Calderhead, J. (1989). Reflective teaching and teacher education. *Teaching and Teacher Education*, *5*(1), 43-51. doi: 10.1016/0742-051X(89)90018-8

Campbell, P. F., Nishio, M., Smith, T. M., Clark, L. M., Conant, D. L., Rust, A. H., DePiper, J.N., Frank, T.J., Griffin, M.J., & Choi, Y. (2014). The relationship between teachers' mathematical content and pedagogical knowledge, teachers' perceptions, and student achievement. *Journal for Research in Mathematics Education*, *45*(4), 419-459.

Cantrell, S., & Kane, T. J. (2013). *Ensuring fair and reliable measures of effective teaching: Culminating findings from the MET project's three-year study*. Seattle, WA: Bill & Melinda Gates Foundation. Available from http://www.metproject.org/downloads/MET_Ensuring_Fair_and_Reliable_Measures_Practitioner_Brief.pdf

Carless, D. (2006). Differing perceptions in the feedback process. *Studies in Higher Education*, *31*(2), 219-233. doi: 10.1080/03075070600572132

Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., Lively, T.J., & White, C. E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, *39*(2), 188-215. doi: 10.1598/RRQ.39.2.3

Cartledge, G., & Kourea, L. (2008). Culturally responsive classrooms for culturally diverse students with and at risk for disabilities. *Exceptional Children*, *74*(3), 351-371. doi: 10.1177/001440290807400305

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(1), 1-6. doi: 10.1080/00098650903267784

Cazden, C. (2001). Classroom discourse and student learning. In *Classroom discourse: The language of teaching and learning* (pp. 60-80). Portsmouth, NH: Heinemann.

© 2015 Stanford Center for Assessment, Learning and Equity

Chin, C., & Osborne, J. (2008). Students' questions: A potential resource for teaching and learning science. *Studies in Science Education, 44*(1), 1-39. doi: 10.1080/03057260701828101

Chung Wei, R., & Pecheone, R. L. (2010). Assessment for learning in preservice teacher education: Performance-based assessments. . In M. Kennedy (Ed.), *Teacher assessment and the quest for teacher quality: A handbook* (pp. 69-132). San Francisco, CA: John Wiley & Sons.

Clark, I. (2012). Formative assessment: Assessment is for self-regulated learning. *Educational Psychology Review, 24*(2), 205–249. doi:10.1007/s10648-011- 9191-6

Cochran-Smith, M. (2001). The outcomes question in teacher education. *Teaching and Teacher Education*, *17*(5), 527-546. doi:10.1016/S0742-051X(01)00012-9

Cochran-Smith, M., & Zeichner, K. M. (Eds.). (2005). *Studying teacher education: The report of the AERA Panel on Research and Teacher Education*. Mahwah, NJ: Erlbaum.

Cowan, J., & Goldhaber, D. (2014). *Assessing the relationship between teacher performance on Washington state's ProTeach Portfolio and student test performance* (CEDR Working Paper 2014-2). Seattle, WA: University of Washington. Retrieved on January 13, 2015 from http://www.cedr.us/papers/working/CEDR%20WP%202014-2.pdf

Cummins, J. (1984). Wanted: A theoretical framework for relating language proficiency to academic achievement among bilingual students. In C. Rivera (Ed.), *Language proficiency and academic achievement. Multilingual Matters 10* (pp. 2-19). Clevedon, Avon, England: Multilingual Matters.

Darling-Hammond, L. (2008). Teacher learning that supports student learning. In B. Presseisen (Ed.), *Teaching for intelligence* (2nd ed.) (pp. 91-100). Thousand Oaks, CA: Corwin Press.

Darling-Hammond, L. (2010). *Evaluating teacher effectiveness: How teacher performance assessments can measure and improve teaching*. Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2010/10/pdf/teacher_effectiveness.pdf

Darling-Hammond, L. (2012). *Powerful teacher education: Lessons from exemplary programs*. San Francisco, CA: John Wiley & Sons.

Darling-Hammond, L., Newton, S. P., & Wei, R. C. (2013). Developing and assessing beginning teacher effectiveness: The potential of performance assessments. *Educational Assessment, Evaluation and Accountability*, *25*(3), 179-204. doi: 10.1007/s11092-013-9163-0

Darling-Hammond, L., & Snyder, J. (2000). Authentic assessment of teaching in context. *Teaching and Teacher Education, 16* (5), 523-545. doi: 10.1016/S0742-051X(00)00015-9

© 2015 Stanford Center for Assessment, Learning and Equity

De La Paz, S., Felton, M., Monte-Sano, C., Croninger, R., Jackson, C., Deogracias, J. S., & Hoffman, B.P. (2014). Developing historical reading and writing with adolescent readers: Effects on student learning. *Theory & Research in Social Education*, *42*(2), 228-274. doi: 10.1080/00933104.2014.908754

Diez, M. E. (2001). Assessing student competence in teacher education programs. In C.A. Palomba & T.W. Banta (Eds.), *Assessing student competence in accredited disciplines: Pioneering approaches to assessment in higher education* (pp. 29-48). Sterling, VA: Stylus.

Diez, M. E. (2010). It is complicated: Unpacking the flow of teacher education's impact on student learning. *Journal of Teacher Education*, *61*(5), 441-450. doi: 10.1177/0022487110372927

Durlak, J., Weissberg, R., Dymnicki, A., Taylor, & Schellinger, K. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405-432. doi: 10.1111/j.1467- 8624.2010.01564.x

Duschl, R. A., & Gitomer, D. H. (1997). Strategies and challenges to changing the focus of assessment and instruction in science classrooms. *Educational Assessment*, *4*(1), 37-73.

Edwards, C. J., Carr, S., & Siegel, W. (2006). Influences of experiences and training on effective teaching practices to meet the needs of diverse learners in schools. *Education, 126*(3). Retrieved from http://www.questia.com/library/journal/1G1- 145681751/influences-of-experiences-and-training-on-effective

Emmer, E.T., & Stough, L.M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychologist*, *36*(2), 103- 112. doi: 10.1207/S15326985EP3602_5

Engle, R. A. (2012). The productive disciplinary engagement framework: Origins, key concepts, and developments. In Y. Dai (Ed.), *Design research on learning and thinking in educational settings: Enhancing intellectual growth and functioning* (pp. 161-200). New York, NY: Routledge.

Epstein, A. S. (2006). *The intentional teacher: Choosing the best strategies for young children's learning.* Washington, DC: National Association for the Education of Young Children.

Evertson, C.M., & Weinstein, C.S. (Eds.). (2006). *Handbook of classroom management: Research, practice, and contemporary issues*. Mahwah, NJ: Erlbaum.

Fillmore, L. W., & Snow, C. E. (2000). *What teachers need to know about language*. Washington, DC: Center for Applied Linguistics. Retrieved September 12, 2014, from http://files.eric.ed.gov/fulltext/ED444379.pdf

© 2015 Stanford Center for Assessment, Learning and Equity

Finn, J., & Zimmer, K. (2012). Student engagement: What is it? Why does it matter? In S. L. Christenson, A. Richley, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97-131). New York, NY: Springer Science + Business Media.

Fogo, B. (2014). Core practices for teaching history: The results of a Delphi panel survey. *Theory & Research in Social Education*, *42*(2), 151-196. doi: 10.1080/00933104.2014.902781

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59-109. doi: 10.3102/00346543074001059

Galguera, T. (2011). Participant structures as professional learning tasks and the development of pedagogical language knowledge among preservice teachers. *Teacher Education Quarterly*, *38*(1), 85-106.

Gallimore, R., Ermeling, B. A., Saunders, W. M., & Goldenberg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *The Elementary School Journal*, *109*(5), 537-553. doi: 10.1086/597001

Gamoran, A. & Nystrand, M. (1992). Taking students seriously. Newmann, F. F., Wehlage, G. G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11-39). New York, NY: Teachers College Press.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106-116. doi: 10.1177/0022487102053002003

Gearhart, M., Nagashima, S., Pfotenhauer, J., Clark, S., Schwab, C., Vendlinski, T., Osmundson, E., Herman, J., & Bernbaum, D. J. (2006). Developing expertise with classroom assessment in K–12 science: Learning to interpret student work. Interim findings from a 2-year study. *Educational Assessment*, *11*(3-4), 237-263. doi: 10.1080/10627197.2006.9652990

Gibbons, P. (2002). *Scaffolding language, scaffolding learning: Teaching second language learners in the mainstream classroom*. Portsmouth, NH: Heinemann.

Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, *1*(1), 3-31. Retrieved from http://www2.glos.ac.uk/offload/tli/lets/lathe/issue1/articles/simpson.pdf

Gitomer, D. H. (Ed.). (2009). *Measurement issues and assessment for teaching quality*. Thousand Oaks, CA: SAGE Publications.

Glaser, R., Chudowsky, N., & Pellegrino, J. W. (Eds.). (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academies Press.

© 2015 Stanford Center for Assessment, Learning and Equity

Goldhaber, D., & Anthony, E. (2007). Can teacher quality be effectively assessed? National Board certification as a signal of effective teaching. *The Review of Economics and Statistics*, *89*(1), 134-150. www.mitpressjournals.org/doi/pdf/10.1162/rest.89.1.134

Gonzalez, N., Moll, L. C., & Amanti, C. (Eds.). (2005). *Funds of knowledge: Theorizing practices in households, communities, and classrooms*. Mahwah, NJ: Erlbaum.

Gresalfi, M., Martin, T., Hand, V., & Greeno, J. (2009). Constructing competence: An analysis of student participation in the activity systems of mathematics classrooms. *Educational Studies in Mathematics, 70*(1), 49-70. doi: 10.1007/s10649-008-9141-5

Grossman, P., Schoenfeld, A., & Lee, C. (2005). Teaching subject matter. In L. Darling- Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 201-231). San Francisco, CA: Jossey- Bass.

Haertel, E. H. (1987). Toward a National Board of Teaching Standards: The Stanford Teacher Assessment Project. *Educational Measurement: Issues and Practice*, *6*(1), 23-24. doi: 10.1111/j.1745-3992.1987.tb00396.x

Haertel, E. H. (1991). New forms of teacher assessment. *Review of Research in Education*, *17*(1), 3-29. doi: 10.3102/0091732X017001003

Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J. C. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=12

Harlen, W. (2005). Teachers' summative practices and assessment for learning--tensions and synergies. *The Curriculum Journal*, *16*(2), 207-223. doi: 10.1080/09585170500136093

Hashweh, M. Z. (2005). Teacher pedagogical constructions: A reconfiguration of pedagogical content knowledge. *Teachers and Teaching: Theory and Practice*, *11*(3), 273-292. doi: 10.1080/13450600500105502

Hattie, J. (2013). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement* (pp.173-178*)*. New York, NY: Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi: 10.3102/003465430298487

© 2015 Stanford Center for Assessment, Learning and Equity

Havnes, A., Smith, K., Dysthe, O., & Ludvigsen, K. (2012). Formative assessment and feedback: Making learning visible. *Studies in Educational Evaluation, 38*(1), 21-27. doi: 10.1016/j.stueduc.2012.04.001

Herman, J. L. (1992). What research tells us about good assessment. *Educational Leadership*, *49*(8), 74-78.

Herman, J.L., Aschbacher, P.R., & Winters, L. (1992). *A practical guide to alternative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Hiebert, J., & Grouws, D.A. (2007). The effects of classroom mathematics teaching on students' learning. In F.K. Lester, Jr. (Ed.), *Second handbook of research on mathematics teaching and learning: A project of the National Council of Teachers of Mathematics* (pp. 371-404). Charlotte, NC: Information Age Publishing.

Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, *58*(1), 47-61. doi: 10.1177/0022487106295726

Hiebert, J., Morris, A. K., & Glass, B. (2003). Learning to learn to teach: An "experiment" model for teaching and teacher preparation in mathematics. *Journal of Mathematics Teacher Education*, *6*(3), 201-222. doi: 10.1023/A:1025162108648

Hill, H., Ball, D., & Schilling, S. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic specific knowledge of students. *Journal for Research in Mathematics Education, 39*(4), 372-400.

Hill, H., Blunk, M., Charalambous, C., Lewis, J., Phelps, G., Sleep, L., & Ball, D. (2008). Mathematical knowledge for teaching and the mathematical quality of instruction: An exploratory study. *Cognition and Instruction, 26*(4), 430-511. doi: 10.1080/07370000802177235

Hollins, E. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education, 62*(4), 395-407. doi: 10.1177/0022487111409415

Hornby, G. (2014). Effective teaching strategies for inclusive special education. In *Inclusive Special Education* (pp. 61-82). New York, NY: Springer.

Jay, J., & Johnson, K. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education, 18*, 73-85. doi: 10.1016/S0742- 051X(01)00051-8

Jennings, L., & Mills, H. (2009). Constructing a discourse of inquiry: Findings from a five-year ethnography at one elementary school. *Teachers College Record, 111*(7), 1583-1618.

Kamil, M. L., Mosenthal, P. B., Pearson, P. D., & Barr, R. (Eds.). (2000). *Handbook of reading research: Volume III*. New York, NY: Routledge.

© 2015 Stanford Center for Assessment, Learning and Equity

Kane, T. J., & Staiger, D. O. (2012). ***Gathering feedback for teaching: Combining high-quality observations with student surveys and achievement gains*** **(Research Paper). MET Project. Seattle, WA: Bill & Melinda Gates Foundation.**

Kazemi, E., & Franke, M. L. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. ***Journal of Mathematics Teacher Education*****, *7*(3), 203- 235. doi: 10.1023/B:JMTE.0000033084.26326.19**

Kelly, G. J. (2007). Discourse in science classrooms. In S. Abell & N. Lederman (Eds.), ***Handbook of research on science education*** **(pp. 443-469*).* Mahwah, NJ: Erlbaum.**

Khishfe, R., & Abd-El-Khalick, F. (2002). Influence of explicit and reflective versus implicit inquiry-oriented instruction on sixth graders' views of nature of science. ***Journal of Research in Science Teaching*****, *39*(7), 551-578. doi: 10.1002/tea.10036**

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. ***Psychological Bulletin*****, *119*(2), 254-284. doi: 10.1037/0033-909.119.2.254**

Korthagen, F., & Vasalos, A. (2005). Levels in reflection: core reflection as a means to enhance professional growth. ***Teachers and Teaching: Theory and Practice*****, 11(1), 47–71. doi: 10.1080/1354060042000337093**

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. ***American Educational Research Journal, 32*****(3), 465-491. doi: 10.3102/00028312032003465**

Lawson, M., & Lawson, H. (2013). New conceptual frameworks for student engagement, research, policy, and practice. ***Review of Educational Research, 83*****(3), 432-479. doi: 10.3102/0034654313480891**

Lederman, N. G. (1992). Students' and teachers' conceptions of the nature of science: A review of the research. ***Journal of Research in Science Teaching*****, *29*(4), 331-359. doi: 10.1002/tea.3660290404**

LePage, P., Darling-Hammond, L., Akar, H., Gutierrez, C., Jenkins-Gunn, E., & Rosebrock, K. (2005). Classroom management. In L. Darling-Hammond & J. Bransford (Eds.), ***Preparing teachers for a changing world: What teachers should learn and be able to do*** **(pp. 327-357). San Francisco, CA: Jossey-Bass/John Wiley.**

Linn, R. L., Baker, E. L., & Dunbar, S. B. (1991). Complex, performance-based assessment: Expectations and validation criteria. ***Educational Researcher*****, *20*(8), 15-21. doi: 10.3102/0013189X020008015**

© 2015 Stanford Center for Assessment, Learning and Equity

Little, J. W., Gearhart, M., Curry, M., & Kafka, J. (2003). Looking at student work for teacher learning, teacher, community and school reform. *Phi Delta Kappan*, *85*(3), 184-192. doi: 10.1177/003172170308500305

Loucks-Horsley, S., & Olson, S. (Eds.). (2000). *Inquiry and the National Science Education Standards: A guide for teaching and learning*. Washington, DC: National Academies Press.

Lucas, T., Villegas, A. M., & Freedson-Gonzalez, M. (2008). Linguistically responsive teacher education preparing classroom teachers to teach English language learners. *Journal of Teacher Education*, *59*(4), 361-373. doi: 10.1177/0022487108322110

Lucas, T., & Villegas, A. M. (2013). Preparing linguistically responsive teachers: Laying the foundation in preservice teacher education. *Theory Into Practice*, *52*(2), 98-109. doi: 10.1080/00405841.2013.770327

Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist*, *47*(2), 71-85. doi: 10.1080/00461520.2012.667064

Marcos, J., & Tillema, H. (2006). Studying studies on teacher reflection and action: An appraisal of research contributions. *Educational Research Review*, *1*(2), 112-132. doi: 10.1016/j.edurev.2006.08.003

Marks, H. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal, 37*(1), 153- 184. doi: 10.3102/00028312037001153

Marx, R., Blumenfeld, P., Krajcik, J., Fishman, B., Soloway, E., Geier, R., & Tali Tal, R. (2004). Inquiry-based science in the middle grades: Assessment of learning in urban systemic reform. *Journal of Research in Science Teaching*, *41*(10), 1063-1080. doi:10.1002/tea.20039

Marzano, R. J., Pickering, D., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., . . . Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, *79*(3), 732-749. doi: 10.1111/j.1467-8624.2008.01154.x

Michaels, S., O'Connor, C., & Resnick, L.B. (2008). Deliberative discourse idealized and realized: Accountable talk in the classroom and civic life. *Studies in Philosophy and Education, 27*(4), 283-297. doi: 10.1007/s11217-007-9071-1

© 2015 Stanford Center for Assessment, Learning and Equity

Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2002). Design and analysis in task-based language assessment. *Language Testing*, *19*(4), 477-496. doi: 10.1191/0265532202lt241oa

Molina, S. (2013). The value of meaning-making and cultural knowledge for teachers working in culturally and linguistically diverse contexts. *Journal of Teaching and Teacher Education: An International Journal, 1*(1), 1-16.

Moll, L.C., Amanti, C., Neff, D., Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, *31*(2), 132-141. doi: 10.1080/00405849209543534

Monte-Sano, C., De La Paz, S., & Felton, M. (2014). Implementing a disciplinary-literacy curriculum for US history: Learning from expert middle school teachers in diverse classrooms. *Journal of Curriculum Studies*, *46*(4), 540-575. doi: 10.1080/00220272.2014.904444

Nagy, W., & Townsend, D. (2012). Words as tools: Learning academic vocabulary as language acquisition. *Reading Research Quarterly*, *47*(1), 91-108. doi:10.1002/RRQ.011

National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel.* Washington, DC: U.S. Department of Education. Retrieved from http://www2.ed.gov/about/bdscomm/list/mathpanel/report/final- report.pdf

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC: National Institutes of Health. Retrieved from https://www.nichd.nih.gov/publications/pages/pubs_details.aspx?from=&pubs_id=88

Newmann, F. M., Wehlage, G. G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11-39). New York, NY: Teachers College Press.

Noble, T. (2004). Integrating the revised Bloom's taxonomy with multiple intelligences: A planning tool for curriculum differentiation. *The Teachers College Record*, *106*(1), 193-211.

Norman, P. (2011). Planning for what kind of teaching? Supporting cooperating teachers as teachers of planning. *Teacher Education Quarterly*, *38*(3), 49-68.

Nystrand, M. (2006). Research on the role of classroom discourse as it affects reading comprehension. *Research in the Teaching of English, 40*(4), 392-412.

Patrick, H., Kaplan, A., & Ryan, A. (2011). Positive classroom motivational environments: Convergence between mastery goal structure and classroom social climate. *Journal of Educational Psychology, 103*(2), 367-382. doi: 10.1037/a0023311

© 2015 Stanford Center for Assessment, Learning and Equity

Payton, J., Weissberg, R., Durlak, J., Dymnicki, A., Taylor, R., Schellinger, K., & Pachan, M. (2008). ***The positive impact of social and emotional learning for kindergarten to eighth-grade students: Findings from three scientific reviews*** **(Technical Report). Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.**

Pecheone, R. L., & Chung, R. R. (2006). Evidence in teacher education: The Performance Assessment for California Teachers (PACT). ***Journal of Teacher Education***, ***57***(1), 22-36 doi: 10.1177/0022487105284045

Peck, C. A., Singer-Gabella, M., Sloan, T., & Lin, S. (2014). Driving blind: Why we need standardized performance assessment In teacher education. ***Journal of Curriculum and Instruction***, ***8***(1), 8-30. doi:10.3776/joci.2014.v8n1p8-30

Peterson, D., & Taylor, B. (2012). Using higher-order questioning to accelerate students' growth in reading. ***The Reading Teacher, 65***(5), 295-304. doi: 10.1002/TRTR.01045

Pianta, R., Hamre, B., & Allen, J. (2012). Teacher-student relationships and engagement: Conceptualizing, measuring, and improving the capacity of classroom interactions. In S.L. Christensen et. al. (Eds.)*, Handbook of research on student engagement* **(pp. 365-386). New York, NY: Springer Science+Business Media.**

Popham, W. J. (2003). ***Test better, teach better: The instructional role of assessment***. **Alexandria, VA: Association for Supervision and Curriculum Development.**

Popham, W. J. (2009). Assessment literacy for teachers: Faddish or fundamental? ***Theory into Practice***, ***48***(1), 4-11. doi: 10.1080/00405840802577536

Reisman, A. (2012). Reading like a historian: A document-based history curriculum intervention in urban high schools. ***Cognition & Instruction***, ***30***(1), 86-112. doi: 10.1080/07370008.2011.634081

Resnick, L. (2010). Nested learning systems for the thinking curriculum. ***Educational Researcher, 39***(3), 183-197. doi: 10.3102/0013189X10364671

Reynolds, A. (1992). What is competent beginning teaching? A review of the literature. ***Review of Educational Research***, ***62***(1), 135. doi: 10.3102/00346543062001001

Rimm-Kaufman, S., Larsen, R., Baroody, A., Curby, T., Ko, M., Thomas, J., Merritt, E., Abry, T., & DeCoster, J. (2014). Efficacy of the responsive classroom approach: Results from a 3-year, longitudinal randomized controlled trial. ***American Education Research Journal, 51(3), 567-603.*** **doi: 10.3102/0002831214523821**

© 2015 Stanford Center for Assessment, Learning and Equity

Rock, M. L., Gregg, M., Ellis, E., & Gable, R. A. (2008). REACH: A framework for differentiating classroom instruction. *Preventing School Failure: Alternative Education for Children and Youth*, *52*(2), 31-47.

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Ruiz-Primo, M. (2011). Informal formative assessment: The role of instructional dialogues in assessing students' learning. *Studies in Educational Evaluation, 37*(1), 15-24. doi: 10.1016/j.stueduc.2011.04.003

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119-144. doi: 10.1007/BF00117714

Sanders, W. L., & Horn, S. P. (1998). Research findings from the Tennessee Value-Added Assessment System (TVAAS) database: Implications for educational evaluation and research. *Journal of Personnel Evaluation in Education*, *12*(3), 247-256. doi: 10.1023/A:1008067210518

Santos, M., Darling-Hammond, L., & Cheuk, T. (2012). Teacher development to support English language learners in the context of Common Core State Standards. In *Understanding Language Conference, Stanford University, California.* Available at: http://ell.stanford.edu/publication/teacher-development-appropriate-support-ells

Saunders, W., & Goldenberg, C. (2010). Research to guide English language development instruction. In Center for Applied Linguistics (Ed.), *Improving education for English learners: Research-based approaches* (pp. 21-81). Sacramento, CA: California Department of Education Press.

Scarcella, R. (2003). *Academic English: A conceptual framework* (Technical Report 2003- 1). Santa Barbara, CA: University of California Linguistic Minority Research Institute.

Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective*. Mahwah, NJ: Erlbaum.

Schleppegrell, M. J. (2012). Academic language in teaching and learning. *The Elementary School Journal*, *112*(3), 409-418.

Schmeichel, M. (2012). Good teaching? An examination of culturally relevant pedagogy as an equity practice. *Journal of Curriculum Studies, 42*(2), 211-231. doi: 10.1080/00220272.2011.591434

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researcher*, 29(7), 4-14. doi: 10.2307/1176145

© 2015 Stanford Center for Assessment, Learning and Equity

Shepard, L. A. (2001). The role of classroom assessment in teaching and learning. In V. Richardson (Ed.), *Handbook of research on teaching, 4th ed.* (pp. 1066–1101). Washington, DC: American Educational Research Association.

Shepard, L. A. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, *63*(3), 66-70.

Shepard, L., Hammerness, K., Darling Hammond, L., Rust, F., Snowden, J. B., Gorden, E., Gutierrez, C., & Pacheco, A. (2005). Assessment. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 275-326). San Francisco, CA: Jossey-Bass/John Wiley.

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi: 10.3102/0013189X015002004

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

Shute, V. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153- 189. doi: 10.3102/0034654307313795

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*(4), 571-581. doi: 10.1037/0022-0663.85.4.571

Smith, T., W., Baker, W., Hattie, J., & Bond, L. (2008). A validity study of the certification system of the National Board for Professional Teaching Standards. In L. C. Ingvarson & J. Hattie (Eds.), *Assessing teachers for professional certification: The first decade of the National Board for Professional Teaching Standards* (pp. 345–380). Amsterdam, the Netherlands: Elsevier Press.

Snow, C. E., & Uccelli, P. (2009). The challenge of academic language. In D. R. Olson & N. Torrance (Eds.), *The Cambridge handbook of literacy* (pp. 112-133). Cambridge, UK: Cambridge University Press.

Spycher, P. (2009). Learning academic language through science in two linguistically diverse kindergarten classes. *Elementary School Journal*, *109*(4), 359-379. doi:10.1086/593938

Stanford Center for Assessment, Learning and Equity. (2013). 2013 edTPA Field Test: Summary Report. Stanford, CA: Author. Retrieved from https://secure.aacte.org/apps/rl/res_get.php?fid=827&ref=edtpa

Stecker, P. M., Fuchs, L. S., & Fuchs, D. (2005). Using curriculum-based measurement to improve student achievement: Review of research. *Psychology in the Schools*, *42*(8), 795-819. doi:10.1002/pits.20113

© 2015 Stanford Center for Assessment, Learning and Equity

Stein, M. K., Engle, R. A., Smith, M. S., & Hughes, E. K. (2008). Orchestrating productive mathematical discussions: Five practices for helping teachers move beyond show and tell. *Mathematical Thinking and Learning, 10*(4), 313-340. doi:10.1080/10986060802229675

Stiggins, R. (2005). From formative assessment to assessment for learning: A path to success in standards-based schools. *Phi Delta Kapplan, 87*(4), 324-328. Retrieved from http://ati.pearson.com/downloads/fromformat_k0512sti1.pdf

Stiggins, R. J., Arter, J. A., Chappuis, J., & Chappuis, S. (2004). *Classroom assessment for student learning: Doing it right—using it well*. Portland, OR: Assessment Training Institute.

Stigler, J. W., & Hiebert, J. (2009). *The teaching gap: Best ideas from the world's teachers for improving education in the classroom*. New York, NY: Simon and Schuster.

Stipek, D. J., Feiler, R., Byler, P., Ryan, R., Milburn, S., & Salmon, J. M. (1998). Good beginnings: What difference does the program make in preparing young children for school? *Journal of Applied Developmental Psychology, 19*(1), 41-66. doi: 10:1016/S0193-3973(99)80027-6

Strickland, D. S., & Riley-Ayers, S. (2006). *Early literacy: Policy and practice in the preschool years* (National Institute for Early Education Research Policy Brief 10), 1-12. Retrieved July 21, 2014, from http://www.readingrockets.org/article/11375

Subban, P. (2006). Differentiated instruction: A research basis. *International Education Journal*, *7*(7), 935-947.

Tieso, C. (2005). The Effects of Grouping Practices and Curricular Adjustments on Achievement. *Journal for the Education of the Gifted*, *29*(1), 60-89.

Tomlinson, C., Brighton, C., Hertberg, H., Callahan, C., Moon, T., Brimijoin, K., . . . Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classroom settings: A review of literature. *Journal for the Education of the Gifted, 27*(2/3), 119-145.

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction & understanding by design: Connecting content and kids*. Alexandria, VA: Association for Supervision and Curriculum Development.

Townsend, D. R., Filippini, A., Collins, P., & Biancarosa, G. (2012). Evidence for the importance of academic word knowledge for the academic achievement of diverse middle school students. *The Elementary School Journal*, *112*(3), 497–518. doi:10.1086/663301

Turner, J., Meyer, D., Midgley, C., & Patrick, H. (2003). Teacher discourse and sixth graders' reported affect and achievement behaviors in two high-mastery/high-performance mathematics classrooms. *The Elementary School Journal, 103*(4), 357-382. doi:10.1086/499731

© 2015 Stanford Center for Assessment, Learning and Equity

Tyler, R. W. (1950). ***Basic principles of curriculum and instruction, syllabus for Education 360*****. Chicago, IL: University of Chicago Press.**

Valdés, G., Bunch, G., Snow, C., Lee, C., & Matos, L. (2005). Enhancing the development of students' language(s). In L. Darling-Hammond & J. Bransford (Eds.), ***Preparing teachers for a changing world: What teachers should learn and be able to do*** **(pp.126-168). San Francisco, CA: Jossey-Bass.**

Valli, L. (Ed.). (1992). ***Reflective teacher education: Cases and critiques*****. Albany, NY: SUNY Press.**

van Driel, J. H., Beijaard, D., & Verloop, N. (2001). Professional development and reform in science education: The role of teachers' practical knowledge. ***Journal of Research in Science Teaching*****,** ***38*****(2), 137-158. doi: 10.1002/1098-2736(200102)38:2<137::AID-TEA1001>3.0.CO;2- U**

van Lier, L., & Walqui, A. (2012). Language and the Common Core State Standards. ***Commissioned Papers on Language and Literacy Issues in the Common Core State Standards and Next Generation Science Standards*****,** ***94*****, 44. Stanford, CA: Stanford University.**

Villegas, A., & Lucas, T. (2007). The culturally responsive teacher. ***Educational Leadership, 64*****(6), 28- 33.**

Vollmeyer, R., & Rheinberg, F. (2005). A surprising effect of feedback on learning. ***Learning and Instruction*****,** ***15*****(6), 589-602. doi: 10.1016/j.learninstruc.2005.08.001**

Vygotsky, L. (1987). ***Thought and language*****. Cambridge, MA: MIT Press.**

Walqui, A., & van Lier, L. (2010). ***Scaffolding the academic success of adolescent English language learners: A pedagogy of promise*****. San Francisco, CA: WestEd.**

Ward, J., & McCotter, S. (2004). Reflection as a visible outcome for preservice teachers. ***Teaching and Teacher Education, 20*****(3), 243-257. doi: 10.1016/j.tate.2004.02.004**

Watts-Taffe, S., Laster, B., Broach, L., Marinak, B., McDonald Connor, C., & Walker- Dalhouse, D. (2012). Differentiated instruction: Making informed teacher decisions. ***Reading Teacher, 66*****(4), 303-314. doi: 10.1002/TRTR.01126**

Wayman, J. C. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. ***Journal of Education for Students Placed at Risk*****,** ***10*****(3), 295-308. doi: 10.1207/s15327671espr1003_5**

Webb, M. N., Franke, M., Ing, M., Wong, J., Fernandez, C., Shin, N., & Turrou, A. (2014). Engaging with others' mathematical ideas: Interrelationships among student participation, teachers' instructional practices, and learning. ***International Journal of Educational Research, 63*****, 79-93. doi: 10.1016/j.ijer.2013.02.001**

© 2015 Stanford Center for Assessment, Learning and Equity

Weinstein, C. S., Tomlinson-Clarke, S., & Curran, M. (2004). Toward a conception of culturally responsive classroom management. *Journal of Teacher Education*, *55*(1), 25-38. doi: 10.1177/0022487103259812

Whitehurst, G. J., & Lonigan, C. J. (2001). Emergent literacy: Development from prereaders to readers. In S. B. Neuman & C. K. Dickinson (Eds.), *Handbook of early literacy research* (pp.11- 29). New York, NY: Guilford Press.

Wiggins, G., & McTighe, J. (2005). *Understanding by design (2e).* Alexandria, VA: Association for Supervision and Curriculum Development.

Wiliam, D. (2011). What is assessment for learning*? Studies in Educational Evaluation, 37*, 3-14. doi: 10.1016/j.stueduc.2011.03.001

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education: Principles, Policy and Practice, 11*(1), 49-65. doi: 10.1080/0969594042000208994

Wilson, M., Hallam, P. J., Pecheone, R. L., & Moss, P. A. (2014). Evaluating the validity of portfolio assessments for licensure decisions. *Education Policy Analysis Archives*, *22*(6). http://dx.doi.org/10.14507/epaa.v22n6.2014

Wilson, S. (2004). Student assessment as an opportunity to learn in and from one's teaching practice. In M. Wilson (Ed.), *Towards coherence between classroom assessment and accountability, 103rd Yearbook for the National Society for the Study of Education*, *Part II* (pp. 264–271). Chicago, IL: University of Chicago Press.

Wineburg, S. S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology*, *83*(1), 73-87.

Woo Sik, J., (2007). Preservice teacher training for successful inclusion. *Education, 128*(1), 106-113.

Zeichner, K.M. (1994). Research on teacher thinking and different views of reflective practice in teaching and teacher education. In I. Carlgren, G. Handal, & S. Vaage (Eds.), *Teachers' minds and actions: Research on teachers' thinking and practice* (pp. 9-27). Washington, DC: The Falmer Press.

Zeichner, K. M., & Liston, D. P. (1987). Teaching student teachers to reflect. *Harvard Educational Review*, *57*(1), 23-49.

Zeichner, K. M., & Liston, D. P. (2013). *Reflective teaching: An introduction (2e)*. New York, NY: Routledge.

© 2015 Stanford Center for Assessment, Learning and Equity

Zwiers, J. (2007). Teacher practices and perspectives for developing academic language. ***International Journal of Applied Linguistics*****, *17*(1), 93-116.**

Zwiers, J. (2008). ***Building academic language: Essential practices for content classrooms, grades 5-12*****. San Francisco, CA: Jossey-Bass/John Wiley.**

Zwiers, J. (2014). ***Building academic language: Meeting Common Core Standards across disciplines, grades 5-12, 2nd edition*****. San Francisco, CA: Jossey-Bass/John Wiley.**

© 2015 Stanford Center for Assessment, Learning and Equity