Analysis of Syllabi Intending to Prepare Teachers to be Data Literate:

An Interim Report

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BACKGROUND COMMENTS

This report documents the work of one component of a larger research effort. The objective of the project is to understand what schools of education are doing to prepare teachers to use data in their practice. The issue is multifaceted, complex, and systemic. Schools of education do not act alone to suddenly introduce courses on data-driven decision making into their curricula because they have a whim to do so or because policymakers say that data literacy among educators is important. Schools of education must come to realize on their own that building the human capacity to use data among their teacher candidates is a response to needs from the field, stimulated in part by policymakers' rhetoric that education must become an evidence-based field. The study, of which this report is a part, contains three distinct, but interconnected components that, in combination, provide a depiction of the landscape of teacher preparation and data literacy. The components include a survey to schools of education, a review of selected syllabi, and an analysis of state licensure documents and requirements. This document focuses on the syllabus analysis.

BACKGROUND INFORMATION

The survey and analysis of the state credentialing language provides one lens to examine the opportunity teachers have to learn about data literacy in their pre-and inservice courses offered in schools of education. The course syllabi provide another such lens that can be used to triangulate the findings from the survey analysis. Syllabi present in general terms the content and perspective of the course that is being taught (Hess & Kelly, 2007). They identify the topics that will be addressed by the instructor and the information that will be read by the students. As Hess and Kelly (2007) indicate "syllabi are like blueprints: they reveal structure and design, even if they do not fully reflect what real-life instruction looks like" (p. 246). The course readings and the topics of the class discourse include one level of information about what is in the course. Stronger indications of the opportunity that students have to learn the knowledge and skills of data literacy are found in the nature of the assignments that students must complete. We examined the focus of the course generally and used the framework of data literacy that is operationalized in the survey to identify the focus of each lesson.

It is important to emphasize that this analysis is descriptive, not evaluative. The syllabi were examined for the extent to which they included the categories of knowledge and skill that were identified in Mandinach & Gummer (2012, 2013). Unlike the study conducted by Greenburg and Walsh, 2012) that sought to rate schools of education for the quality of teacher preparation in assessment, the syllabi for this study were not rated against a rubric that assigned them a value based on the depth of coverage against some metric.

PROJECT DESCRIPTION

DATA SOURCE

The 80 syllabi were submitted by a subset of schools of education that responded to the survey. The submission of syllabi was voluntary and 48 schools of education provided at least one syllabus. Two of the syllabi came from a school of education that did not complete the survey, and the syllabi from this school of education was not included in this analysis. One of the schools submitted a single syllabus from a course that was intended for educational administrators and was not included in the analysis. Ten of the schools of education provided multiple syllabi. All of the multiple syllabi from a given school of education were examined, and the one that most directly addressed the issue of data literacy was included in this analysis. For instance, some schools of education included a course for administrators in their syllabi and the target audience precluded the use of the syllabus for this analysis. Similarly, if a course was focused on general topics of educational psychology and no focus on data could be ascertained, it was not included in this analysis. A total of 44 syllabi were used for the initial analysis, which looked holistically at the course content and type.

Two additional analyses were conducted for this study. One examined the nature of the assignments required of students in the course to ascertain the extent to which they supported the development of data literacy. Only complete syllabi that included a description of the course objectives, required textbooks and readings, lectures or discussion threads and assignments were used for the analysis of the assignments. A total of 35 syllabi included sufficient information for that analysis. The second additional analysis examined the nature of the content that was addressed during the sessions of the course as seen in the topics in a course calendar. The "course week" was the unit of analysis of the final way that the in this study – what the teacher or teacher candidate studied during a week in the course. If the syllabus did not include a weekly schedule, the syllabus was not included in this analysis. A total of 35 syllabi provided such a calendar and were used for this final analysis.

The schools of education that provided surveys are a subset of those who responded to the survey. As indicated in Table 1, they are largely a representative subset in all of the categories by which the schools of education were classified in the original survey. The exception is that there were no sectarian colleges or universities represented in the syllabus analysis.

Table 1: Comparison of school type in survey and syllabus analysis.

School Type (select all that apply)	Respondents (n = 206)	Holistic Analysis (n = 44)	Assignment Analysis (n = 35)	Course Week (n = 35)
Public	67.3% n = 140	72.7% n = 32	71.4% n = 25	71.4% n = 25
Private – for-profit	2.9% n = 6	2.3% n = 1	2.9% n = 1	2.9% n = 1
Private – not-for-profit	28.4% n = 59	25.0% n = 11	25.7% n = 9	25.7% n = 9
Land grant	12.5% n = 26	11.4% n = 5	14.3% n = 5	8.6% n = 3
Traditional state	8.2%	11.4%	8.6%	11.4%

teachers college	n = 17	n = 5	n = 3	n = 4
Sectarian	2.9% n = 6	0.0% n = 0	0.0% n = 0	0.0% n = 0
Non-sectarian	3.4% n = 7	2.3% n = 1	2.9% n = 1	2.9% n = 1
Other	1.5% n = 3	4.5% n = 2	2.9% n = 1	5.7% n = 2

CODING SYSTEM

The coding system for this analysis is parallel to the structure of the survey and is based on the data literacy framework of Mandinach & Gummer (2011, 2013). The **type of course** was identified and included either stand alone courses or those courses into which the data literacy focus was integrated. Stand-alone courses were coded as assessment/measurement or data literacy courses or as a combination of these based on the extent to which they included topics of data use beyond achievement or affective constructs. Integrated courses included pedagogy, methods, educational philosophy, educational or instructional psychology, statistics or other. The other category included courses with a focus such as the teacher as researcher or inquiry into classroom practice.

The **focus of the course** was determined by the combination of the nature of the assignments and the topics addressed in the course weeks of instruction. These overall foci included the design and implementation of assessments (including both classroom designed and standardized tests), analysis of data, monitoring of student performances, testing and measurement issues, grading of students, diagnosis of specific disciplinary difficulties of students (especially reading), evaluation of students (with a focus on special education), curriculum based measurement (including response to intervention - RtI), and general assessment. A course syllabus might have multiple foci.

Most of the course syllabi were not fine-grained enough to determine the nature of the data that students had the opportunity to analyze. We can assume that if an assignment is to develop and implement the assessment for a unit of instruction, then the data that will be available to analyze will be student and class-level data, unless otherwise specified. It was more difficult to determine when students had the opportunity to analyze school or district level data unless an assignment included specific instructions to do so. When possible, the **data types** were coded as demographic, attendance, behavioral, attitudinal, perceptual, student performance or achievement, summative assessment at the classroom or state level, benchmark of interim assessment, diagnostic, or longitudinal data. The data from this part of the analysis were not considered sufficiently robust to include in this report.

Assignments that emerged from the analysis of the data are shown in Table 2. A total of 36 courses had sufficient description of the assignments of the course to assign codes. The extent and importance of the assignments varied across the syllabi. For instance, a unit plan and assessment could be the major assignment of a course. Or it could be based on an assignment of the design of a unit in another course, and the assessment part of it carried less weight in the course described by the particular syllabus. Assignments could also address multiple codes. A unit plan and assessment might include a requirement for the design or identification of multiple items as well as the design,

implementation and analysis of a summative test. Formative assessment might also be part of this type of assessment.

Table 2. Types of course assignments

Assignment
Lesson plan and assessment
Unit plan and assessment
Summative assessment
Formative assessment
Rubric design
Assessment observation
Standardized assessment description or evaluation
Analysis or writing of specific assessment items or tasks
Assessment observation
Classroom observation
Case study of individual student or small group of students
Data analysis
Grading philosophy
Review of assessment literature on specific topic

The various course weeks of instruction were coded according to categories that were aggregated from the survey using a process similar to that of Hess and Kelly (2007. Only those courses that had a sufficiently explicit calendar of classes with included topics (and readings where available) were used. If the syllabi including only objectives, or an outline of course coverage, the syllabus was discarded for this part of the analysis. Codes were assigned based on an analysis of the terms used to describe the topic that was addressed during the course week and topic of the readings that were assigned. Table 3 indicates the major categories that were used and the issues that were addressed in these categories.

Table 2. Major categories for "course week" topic coding

Topic	Sub-topics
Assessment/measurement	Types of assessment Measurement issues, Purposes and use of assessment
Data topics	Data quality, Data collection processes, Identification of appropriate data to use
Data systems	Data warehouses, Student information, Instructional management, Assessment or diagnostic assessment systems
Data tools	Student dashboards
Analytic processes	Analyzing data from multiple sources, especially standardized tests
Inquiry or collaborative inquiry processes	How to engage in collaborative inquiry,

	How to frame questions to which data can be applied for instructional purposes,
Decision-making topics	Use research and evidence to inform decisions Use data to make instructional decisions Use data to differentiate instruction Engage in collaborative inquiry with other educators Make presentations grounded in data to students or parents Make actionable decisions based on the examination of data Program decision making
Statistics	Norm-referenced Criterion-referenced Validity and reliability Assessment interpretation 1. Mean, median, mode – central tendency 2. Standard deviation 3. Normal curve distributions 4. Central tendency 5. Discrimination level 6. Stanines 7. Percentile rank 8. Raw vs. scaled score 9. Growth index
Assessment reporting	Differences in grain size (cohorts, courses, grades) Reporting levels (scaled scores, percentiles, performance levels)

FINDINGS

Focus of Courses

A holistic analysis of the focus of the courses is based on the coding of the title of the course and the overall topics of the course assignments and activities. Of the 46 course syllabi that had sufficient information for analysis, 35 (76%) were coded as having a major focus on the design, implementation and analysis of types of assessments. The texts for these courses typically address the knowledge and practices that classroom teachers need to know in order to identify or design items to be used in classroom quizzes and tests and tasks that could be used in performance assessments. A secondary focus of these courses was on formative assessment, state assessments or assessment policy issues. The courses ranged in terms of the rigor with which assessment was addressed. Three courses with a focus on educational measurement included a significant focus on statistics, while the majority of the courses that addressed little if any statistics and focused on assessment more globally. The syllabi represented courses that are taught at both the undergraduate and graduate levels. Given the undergraduate status of the course and the morning or early afternoon time at which they were taught, 23 (50%) of the courses were designed for preservice

teachers. It was not clear whether the other courses were specifically designed for inservice teachers or whether they represent a mix of preservice and inservice contexts.

Only one course had a specific focus on data-driven decision making in the title, included texts that were focused on the development of data literacy as well as assessment texts, and included a specific focus on the use of data beyond just achievement or affective data. This course focused on classroom management. Three of the assessment courses had a stronger focus on data literacy. One was a course that integrated assessment and a broader focus on data associated with class sessions that were held in a school. That course will be discussed in more detail below. Two special education courses that were focused on assessment of exceptional students also included a deeper focus on the use of data.

The remaining 10 courses addressed a range of foci including general educational psychology, learning in the content area, methods, teaching practica, and teacher as researcher. The focus on data literacy in these courses was much more limited as will be described in more detail later in this report. These courses were included in the analysis as all had at least one week of the course focused on assessment or one assignment that had students collecting and analyzing data from individual students, small groups, or whole classrooms.

Assignments

The coding of the nature of the assignments focused on what was explicitly required of the students. These assignments ranged from short term weekly journal entries, reflections and quizzes to long term projects, papers, capstone projects, portfolios, field-based assignments connected to projects, and assessments and final exams. A total of 36 syllabi included adequate descriptions of the assignments

Lesson or unit plan with assessments: Of the 132 separate assignments analyzed in this study, one of the two most frequently identified assignments was some sort of lesson or unit plan with assessments. Twenty three of the 36 courses (66%) had either a single lesson or a full unit plan for which an assessment task or tasks was identified or designed, implemented and analyzed. Eight of these courses (23%) required the student to choose only one lesson, which might be the focus of an observation in a cooperating teacher's classroom. Others were full unit plans with assessments and item analysis or design, identified in 15 or (43%) of the syllabi. Unit plans frequently included a requirement that the data from the assessments be analyzed with a focus on how the results informed instruction. However, it was not possible to determine whether that information was to have been used during the course of instruction with immediate consequences for students' opportunities to learn or to plan for future use of the unit plan to teach the unit in the subsequent year. Most of the unit plans addressed a range of assessments from formative assessments that are meant to be used in teaching, to quizzes and unit tests. In two cases, the assessments were added onto a unit plan that was the assignment in another course. The 15 courses that had the analysis or design of assessment items typically also had the student practice writing a range of assessment types, including selected and open response items as well as portfolio design.

Analysis or writing of assessment items: Almost half of the courses, 16 (44%) included an assignment that had students designing assessment items and tasks. On several occasions, the students were required to analyze items that they found in text books or that were used in their

teaching placements. Students practiced a range of item types and formats, and some of the courses spent a majority of the course time with a focus on item design.

Summative assessment: An assignment that was focused on the design and use of a summative assessment was included in 16 (44%) of the syllabi. These assignments included both quizzes that the students designed for use in their classrooms and tests that were included with the assessment system for the plan of a unit of instruction.

Analysis of data: Fourteen (39%) of the courses had an assignment with a specific focus on the analysis of data. These assignments were typically based on the classroom summative assessments that were part of the lesson or unit analysis. They also included assignments where the student teaching candidate collected data from individual students to whom a battery of assessments had been given. The focus of the data analysis was to either provide a description of student learning or to articulate some future teaching that might be needed based on the performance of the children. Five of the courses had explicit language around the use of the data from assessments for instructional decision making. Three of these course assignments indicated that the data analysis would be conducted in class and focus on the use of state test data, but the specifics of how this would happen was not clear.

Rubric design: Almost a third of the courses included an assignment that had the students developing or using a rubric to evaluate student performances. In 11(31%) of the courses, the rubric design was specified either as part of the unit assessment system or as a stand-alone assignment. These rubrics were most frequently associated with the design and implementation of a particular performance task such as a writing assignment or a laboratory report.

Formative assessment: Relatively fewer, ten (28%) of the courses, had an assignment that was focused specifically on formative assessment. These assignments ranged from the design and implementation of a formative assessment with a class or a group of students to the analysis of a reading focused on formative assessment practices.

Statistical analyses: The ways in which some form of statistics was addressed in the courses varied considerable. Only nine (25%) of the courses had assignments that focused on statistical analyses. These might be based on data that was provided in class or that the students needed to obtain from their school placements. The nature of the data that were the focus of these assignments was difficult to ascertain from the description of the assignment in the syllabi.

Case studies: Seven (19%) of the courses had an assignment that was focused on the case study of a student or a small group of students. These assignments occurred in courses that were intended for special education or reading teachers.

Portfolio assessment: Seven (19%) of the courses included an assignment that addressed portfolio assessment in some form. In four of these courses, students were required to reflect on an article about portfolio assessment rather than design and implement elements of such a portfolio.

Table 3 presents a summary of these findings of the major assignment types.

Table 3: Distribution of major assignment types

Assignment	Lesson or unit plan	Assessment items	Summative assessment	Analysis of data	Rubric design	Formative assessment	Statistical analysis	Case studies	Portfolio
Number	23	16	16	14	11	10	9	7	7
Percent	66%	44%	44%	39%	31%	28%	25%	19%	19%

Table 4 indicates the frequency of assignments that occurred in less than 15% percent of the courses. These assignments included grading plans or philosophies, observational assessments, or literature reviews.

Table 4: Remaining assignment types

	Assignment		
	Grading plan/ or philosophy	Observation	Literature Review
Number of courses	3	5	2
Percent of courses	8%	14%	6%

The analysis of assignments provides additional support for the findings based on the holistic focus of the course. As was the case in the initial analysis, the assignments of the courses are largely those that address assessment design and implementation with analysis a distant second. The inclusion of an assignment on data analysis was identified in only 14 of the courses. The assignment to analyze data was typically a general request to consider the implications of the findings from the designed and implemented assessments on teaching, rather than a specific focus on what the analysis meant for student learning.

The focus of the assessment development, implementation and analysis was typically at the level of a particular subject matter or grade level class or unit within a course. Given the number of course syllabi that came from courses for preservice teachers, this focus is understandable as the intent of these courses is to prepare students to engage in their practicum of student teaching. Overall, the assignments included in the syllabi do not show a significant focus on building data literacy apart from assessment.

It is telling that none of the assignments appeared to have the students introduced to or use any particular data system or tool. In only one course were such tools the focus of classroom work of discussions as will be described in the next section. The only technologies integrated into these courses were instructional management systems, such as Blackboard, and teacher portfolio systems, such as Chalk and Wire. In only one course were the students required to use spreadsheets such as Excel.

Course Week Analysis

A total of 35 syllabi had sufficient information about the topics that were addressed in the course identified with a particular "course week" to support the analysis of the categories of topic content.

The courses analyzed included a range of weeks of the course, from 6 weeks for a practicum course to 16 weeks for some of the semester level courses. Several of the courses met more than once a week, and the topic addressed across the multiple sessions in the week as assigned to only one category. A total of 419 course sessions were coded.

Assessment and measurement: This was the category most frequently identified in the course sessions, assigned to 270 (64%) of the course weeks. This category included the purposes and uses of assessments, types of assessment and multiple other assessment and measurement topics. Some of the assessment courses had all by the introductory session and the final session focused on one or more types of assessment items or tasks. Other assessment and measurement topics included introductions to state and federal assessment, such as the PARC and Smarter Balanced assessment systems assuming that their states are participating in one or the other. The representation and communication of assessment information was the focus of another 5 of the course weeks. Measurement topics included concepts such as reliability and validity, as well as the issues of differences in reporting levels from the perspectives of cohorts, courses and grades.

Other: The second most frequent category of the topic of the course week was the "other" category which included discussions and classroom activities that included lesson planning, standards, disciplinary content discussions, learning of students, behavior, motivation, educational philosophy or additional pedagogical topics. A total of 63 (15%) of the sessions were coded into the "other" category. Given the number of courses that were included in this analysis that were provided by the schools of education to show how data literacy was incorporated into multiple courses, this preponderance of other topics as the focus of the course week makes sense.

Analytic processes: Analytic processes were difficult to identify in the sessions that occurred over time in a course. A total of 25 (6%) course weeks appeared to address these processes. Topics that addressed analysis ranged from how to organize data, discuss data with other colleagues or students or parents, and how to identify data sources other than achievement. It also included how to use data from assessments in order to influence teaching, which was the most prevalent instance of this topic. It is interesting that these topics were as frequently the focus of the course week as they were, and this emphasizes the extent to which the courses identified in this study emphasized assessment.

Statistics: Sixteen (4%) of the sessions focused specifically on statistics. Most of the courses included only a cursory coverage of statistics, introducing the students to measures of central tendency. Several of the courses, especially the measurement courses included multiple sessions on statistics, introducing students to different kinds of analysis and considering statistical error in measurement.

Data topics: Eleven course sessions (3%) were identified to address data topics. These topics included data quality, the identification of appropriate data to use for particular decisions, and data collection methods. The final code, data collection methods, differed from the design and implementation of assessment items and tasks, and was found in only 3 of the courses that were designed for special education teachers.

Data-driven decision making: The course weeks were rarely labeled as addressing data-driven decision making specifically. These were largely identified by the nature of the reading that was assigned as the reading for the course session and were identified in only 7 (2%) of the course

weeks. These topics included the use research and evidence to inform decision, the use data to make instructional decisions, the use of data to differentiate instruction, and program decision making

The specific category of **inquiry around data** was the focus of only four (<1%) class sessions. Two of the courses that were focused on special education included group work with students were required to work in collaborative groups to identify problems of specific student performance around which they were to design their interventions. In a third class, the students were assigned to groups in order to design and implement their assessment tasks.

The **data system** category was assigned to only four (<1%) class sessions and the discussion of **data tools** was included in only one class session. These class sessions focused on readings that included a brief discussion of data systems and tools. This lack of emphasis on data systems and tools again reflects the focus of the courses on assessment literacy rather than data literacy. In only one course were the students provided with the opportunity for exploring the nature and use of data systems, and that was a course that included half of the class sessions in a local high school. In this course, the objectives of two course sessions included the following:

- To identify the basic structure and philosophy of the DDM systems
- To implement common and state-of-the-art technologies used by schools to collect, analyze and report on student outcomes
- To understand how to use technological systems and information technologies
- To collect, retrieve and analyze student-learning outcomes
- To realize the structure and function of relational databases

This course included assignments that required that students develop a unit plan with assessments, implement a formative assessment with a group of students, and analyze and write assessment items. It is one of only three courses that required students to write a grading plan or philosophy.

Two of the codes included in these final two categories were difficult to determine from the syllabi and may be underrepresented in the findings. These include data topics of **data collection processes**, which may logically have been integrated within the discussion of the design of different assessment items and tasks and **identification of appropriate data to use**, which may have been incorporated in the instruction of which assessment tasks or items to use for which purposes. From a data literacy perspective, these two codes are used in an assessment rather than a data literacy perspective as they focused on the design and implementation of assessments for classroom or individual student use with an apparent focus on individual and student achievement or affect.

The category of data decision making included two additional codes that were difficult to see in the topics assigned during the course weeks. It was difficult to see how the courses specifically addressed **using data to make instructional decisions** and **using data to differentiate instruction**. Again, these activities might have been included in the discussion of assessment use, or in instructional design, but they were not specifically associated with data use.

Table 5 provides the overall distribution of topics by course weeks. Overall, the analysis of the content addressed during the course weeks affirms the findings of the holistic examination of course focus and the analysis based on the assignments. These courses provided by the schools of education in response to a request for experiences students had with data literacy largely address assessment literacy.

Table 5: Percentage of course weeks that addressed data literacy topics

Topic	Assessment and Measurement	Assessment Representation	Analytic Processes	Statistics	Data Topics	Data-driven Decision Making	Data Systems	Data Tools
Number	270	4	25	16	11	7	4	4
Percent	64%	<1%	6%	4%	3%	2%	<1%	<1%

A total of 63 course weeks were assigned to the "other" category

CAVEATS, CONCLUSIONS AND NEXT STEPS

There are limitations to this part of the study that need careful consideration. The courses provided were volunteered by the schools of education, relying on the knowledge of the programs by the person(s) responding to the surveys. There is the possibility that the request for the course was relayed from person to person until someone responded with a course that he or she felt would fit the request. For this analysis, only one course per institution was used, typically the course that appeared to most strongly address the use of data. It is possible that the course chosen for the syllabus analysis is not the course that was at the center of the respondent's consideration when he or she filled out the survey. It is possible that the analysis of a suite of courses would provide a better picture of how a focus of data across a number of courses was developed, but the initial analysis of the multiple course sets did not support such a hypothesis. The sample of schools of education who provided multiple courses is quite small.

Syllabus analysis provides only an abbreviated record of what a particular course provides as an opportunity to learn to students. David Labaree is quoted in Keller (2003, p.8) as describing syllabi as nothing more than "an ideological portrait" that provide little substantive information about what a course addresses. However, we agree with Hess and Kelly (2007, p.246) that "syllabi are like blueprints: they reveal structure and design, even if they do not fully reflect what real-life instruction looks like". The syllabus analysis is only one element of this study, and it is based on a limited sample of volunteered syllabi. However, it provides one mechanism to triangulate the data from the survey and from the analysis of certification regulations to begin to look inside the survey responses to develop a better picture of how schools of education operationalize what they identify as data literacy.

The findings across the three types of analysis, holistic focus of the course, analysis of the student assignments and identification of the course content through analysis of the course weeks provides a picture of how the schools of education appear to be focused on assessment rather than on the broader picture of data literacy that has emerged as a crucial function of what teachers should know and be able to do in the school. The holistic analysis indicates that the majority of the courses are focused on assessment. The assignments required of students predominantly involve the design and review of assessment items or the assessment plans for lessons or units of study. The number of course weeks assigned to the discussion of assessment and measurement design issues is the majority of the time spent in these courses.

The preponderance of courses that focused on assessment design and implementation brings into question the ways in which the school of education faculty and administrators who supplied the

course syllabi are interpreting the focus of the course on data literacy. The request for the course syllabus in the survey came before the questions that asked about specific data literacy knowledge and skills that made up subsequent survey items. However, it is also possible that the survey respondents were using the specific sets of knowledge and skills that are listed in the survey to construct the map onto the courses taught in their institutions that they felt best aligned with the request.

The survey analysis provides an intriguing glimpse into the opportunity preparing teachers have to develop data literacy. A frustrating limitation of the syllabi prompted us to frequently wish we had the opportunity to talk to the faculty member, to ask for additional details about some of the assignments or in-class experiences to determine whether or not the students were focused on more than just assessment data and experiences. It was also impossible to determine the ways in which a focus of data was seen as a thread that connected the courses within a program when the schools of education volunteered more than one course. The next logical step of this study would be to conduct case studies of a selection of schools of education to have the opportunity to examine in more detail the assumptions of intent that are evident in the coding of the syllabi. Such case studies might include the assessment course that had the students working in the schools and experiencing the use of data technology. It would also include a sample of the schools whose courses for special education students appeared to have a stronger focus on data literacy than on assessment literacy with the opportunity to examine the reasons why such might be the case. A set of case studies might also examine how and why the respondents provided assessment and measurement courses in response to a survey on data literacy to get a better understanding of their perceptions of data literacy.

References

Greenberg, J. & Walsh, K. (2012). What teacher preparation programs teach about K-12 assessment: A review. National Council on Teacher Quality. Retrieved 8/14/2013 from http://www.nctq.org/p/edschools/docs/assessment_publication.pdf

Hess, F. & Kelly, A. (2007). Learning to lead: What gets taught in principal-preparation programs. *Teacher College Record. 109* (1). pp. 244-274.

Keller, B. (2003). Education school courses faulted as intellectually thin. *Education Week, 23*(11), 8.

Mandinach, E. B., & Gummer, E. S. (2012). *Navigating the landscape of data literacy: It IS complex.* Washington, DC & Portland, OR: WestEd and Education Northwest.

Mandinach, E. B., & Gummer, E. S. (2013). A systemic view of implementing data literacy into educator preparation. *Educational Researcher*, *42*(1), 30-37.