Standard 12: Assessment and Data

The program trains teacher candidates how to assess learning and use student performance data to inform instruction.

Why this standard?
Great teachers know what concepts and skills their students have mastered and what they still have trouble understanding. Not surprisingly, there is increasing evidence that the better a teacher becomes at pinpointing what students need to learn, the better the students do learn. The capacity to develop assessments (e.g., quizzes), as well as to analyze and interpret assessment results to improve instruction, are explicit skills teacher candidates should have an opportunity to practice.

What is the focus of the standard?
Coursework and assignments representing the culmination of a candidate’s preparation are examined to check that elementary and secondary teacher candidates have an opportunity to practice developing their own assessments, analyzing student assessment results, and applying their analysis to lesson planning. We also check to see that candidates have an opportunity to practice analyzing student data in teams because schools are increasingly fostering a collaborative approach to teaching. The “strong design” (ㄒ) indicator evaluates the structure of coursework in which preparation related to assessment is provided, examining whether a core assessment course is complemented by coverage of subject-specific assessment topics in methods courses.

Standard applies to elementary and secondary programs.

Standard and Indicators ........................................................................................................................................page 2

Rationale ..............................................................................................................................................................page 3
The rationale summarizes research about this standard. The rationale also describes practices in the United States and other countries related to this standard, as well as support for this standard from school leaders, superintendents and others education personnel.

Methodology ..........................................................................................................................................................page 5
The methodology describes the process NCTQ uses to score institutions of higher education on this standard. It explains the data sources, analysis process, and how the standard and indicators are operationalized in scoring.

Research Inventory ................................................................................................................................................page 10
The research inventory cites the relevant research studies on topics generally related to this standard. Not all studies in the inventory are directly relevant to the specific indicators of the standard, but rather they are related to the broader issues that the standard addresses. Each study is reviewed and categorized based on the strength of its methodology and whether it measures student outcomes. The strongest “green cell” studies are those that both have a strong design and measure student outcomes.
Standard and Indicators

Standard 12: Assessment and Data

The program trains teacher candidates how to assess learning and use student performance data to inform instruction.

Standard applies to: Elementary and Secondary programs.

Indicators that the program meets the standard:

12.1 The instructional role of standardized tests, particularly the program state’s standardized tests, is reviewed by teacher candidates.

12.2 Teacher candidates are required to prepare formative and summative classroom assessments.

12.3 Individually and in teams, teacher candidates are taught how to interpret and apply data from both standardized and classroom assessments in order to inform instruction.

STRONG DESIGN

12.4 A program will receive a “strong design” designation if instruction satisfying indicators 12.1-12.3 is provided through a combination of 1) a core data literacy course also addressing the use and misuse of assessment data, the issue of bias, and the meaning of validity and reliability in the context of testing, and 2) one or more courses addressing subject-specific pedagogical data literacy and including field work assessment assignments closely aligned with that instruction.
Rationale

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Rationale

Research base for this standard
No “strong research”¹ exists with regard to assessment and efficacy of using data for teacher preparation.

However, the application of assessments and data can be beneficial within K-12 education. Some additional research² has found that taking an assessment can be beneficial to students as it enhances learning through strengthened memory representation.³ One study found that frequent quizzes during a lecture decreased

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¹ NCTQ has created “research inventories” that describe research conducted within the last decade or so that has general relevance to aspects of teacher preparation also addressed by one or more of its standards (with the exceptions of the Outcomes and Evidence of Effectiveness standards). These inventories categorize research along two dimensions: design methodology and use of student performance data. Research that satisfies our standards on both is designated as “strong research” and will be identified as such. That research is cited here if it is directly relevant to the standard; strong research is distinguished from other research that is not included in the inventory or is not designated as “strong” in the inventory. Refer to the introduction to the research inventories for more discussion of our approach to categorizing research. If a research inventory has been developed to describe research that generally relates to the same aspect of teacher prep as addressed by a standard, the inventory can be found in the back of this standard book.

² “Additional research” is research that is not designated as “strong” because it is not as recent and/or does not meet the highest standards for design methodology and/or use of student performance data.

students’ mind wandering, increased note-taking, increased performance or a cumulative test, and reduced anxiety about that final test.4

Other support for this standard
Emerging evidence from highly effective schools suggests that making instruction more “data-driven” (i.e., using assessment data to adjust what teachers do) can play a significant role in teacher effectiveness.5 A recent survey of school staff found that over one-quarter (29 percent) of new teachers were not at all prepared or only somewhat prepared to assess students.6

On the basis of emerging research findings, the Institute of Education Sciences provides five recommendations for how educators should use data. These recommendations specify that teachers should use assessment information in a cyclical manner whereby they collect data about student learning, interpret those data to determine how to improve students’ learning, modify instruction based on their determination and collect new data.7 To successfully implement this cycle, teachers must be able to implement both formative and summative strategies to assess their students’ learning, to analyze assessment outcome data and to adjust instruction based on those data.

This standard also receives support from school district superintendents.

4 Szpunar, K. K., Khan, N. Y., & Schacter, D. L. (2013). Interpolated memory tests reduce mind wandering and improve learning of online lectures. Proceedings of the National Academy of Sciences, 110(16), 6313-6317. While this study focuses on college students in an online class, the results may still be generalizable to K-12 students in a classroom setting.
Scoring Methodology

How NCTQ scores the Assessment and Data Standard

Standard and indicators

Data used to score this standard
Evaluation of elementary and secondary programs on Standard 12: Assessment and Data uses the following sources of data:

- Syllabi of relevant required courses
- Capstone projects—often called teacher work samples (TWS) or portfolios and including teacher performance assessments (TPAs)

Who analyzes the data
Two general analysts independently evaluate each elementary and secondary program using a detailed scoring protocol from which this scoring methodology is abstracted. For information on the process by which scoring discrepancies are resolved, see the “scoring processes” section of the General Methodology.

Scope of Analysis
For elementary preparation programs, this analysis is based on evaluation of syllabi in required courses whose descriptions mention assessment and the syllabus for any required math methods course if not already included. Syllabi of required literacy courses are excluded from analysis. For secondary preparation programs, analysis is based on evaluations of syllabi in required courses whose descriptions mention assessment, as well as the syllabus for the required methods course(s) in one core subject. In analysis of both elementary and...
secondary coursework, educational psychology courses taught in a psychology department and special education courses are excluded from analysis.5

In both elementary and secondary programs, capstone projects are also evaluated. Thorough document processing ensures that capstone project descriptions and any other relevant sources of data from student teaching are isolated.

In both undergraduate and graduate programs, Indicator 12.1 is evaluated for reporting purpose (not scoring) using syllabus descriptions of course lecture topics and assigned reading (with course objectives and assignment descriptions providing context as necessary for interpretation). For evaluation of this indicator, references to the state’s standardized tests found in a non-pedagogical context (e.g., in a “Foundations of Education” course) do not satisfy the indicator.

Indicators 12.2 and 12.3 are evaluated for scoring purposes using assignments noted in syllabi and descriptions of capstone projects. Throughout the evaluation, evidence may be taken from several lectures or assignments within one course (and a capstone project, as relevant) as well as across several courses (and the capstone project, as relevant) in order to satisfy a particular indicator. (More discussion of analysis using syllabi.)

Analysts are trained to take the broadest possible interpretation of assessment references and also to consider standard usage. For example, a reference to “accountability” in the context of a lecture on assessment is presumed to refer to the state’s standardized test system because this broad interpretation is justified. However, in the absence of any other description, a requirement that a teacher candidate develop an “authentic assessment” is presumed to satisfy the requirement that candidates develop summative assessments, not both formative and summative assessments, because “authentic assessment” most commonly is posed as an alternative to more traditional forms of summative assessment.

Due to the burden imposed by document processing and analysis, the full sample of programs in the first edition of the Review was not evaluated on this standard. Instead of evaluating all programs for which any material had been provided by an IHE, we instead established a calendar deadline for analysis that would ensure that we could evaluate a sample of sufficient size to provided credible information about the nature of teacher preparation in

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5 Treatment of assessment in educational psychology courses taught in a psychology department that are not designed for teachers are not sufficiently contextualized to K-12 schooling. Special education coursework requires a more specialized evaluation of assessment topics than provided here.
this area. Once this deadline was established, we also prioritized evaluation of programs producing the largest number of teacher candidates each year. Programs were only removed from the sample if it was impossible to make a determination on one or more indicators due to a lack of clarity in data.

How a program earns a “strong design” rating
Evaluation for strong design under this standard entails examination of the structure of assessment-relevant coursework to determine if a core data literacy course is complemented by courses that address assessment through the lens of subject-specific pedagogy and include aligned field work.

Examples of what satisfies or does not satisfy the standard’s indicators

**Instructional role of state’s standardized tests (Indicator 12.1)**

<table>
<thead>
<tr>
<th>✔ - fully satisfies the indicator (reported only)</th>
<th>✘ - does not satisfy the indicator (reported only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The program explicitly addresses the instructional role of standardized tests, particularly the program state’s standardized tests. Examples:</td>
<td></td>
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<tr>
<td>Lecture entitled “<strong>Tennessee Value-Added Assessment System</strong>.”</td>
<td></td>
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<tr>
<td>Lecture on standardized testing with references to the role of assessment in light of No Child Left Behind legislation.</td>
<td></td>
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<tr>
<td>Lecture entitled “<strong>Standardized Tests and Accountability</strong>.”</td>
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<tr>
<td>Capstone project that requires teacher candidates to report and reflect on their school’s state testing data and progress toward Annual Yearly Progress (AYP).</td>
<td></td>
</tr>
<tr>
<td>Course objective outline that lists coverage of the <strong>North Carolina EOGs</strong>, and list of lecture topics that includes “<strong>Standardized Testing</strong>.”</td>
<td></td>
</tr>
<tr>
<td>Assignment to analyze the **Georgia Performance Standards for grades 6-8 in candidate’s primary and secondary certification areas, compare to expectations for student achievement on the CRCT and analyze how NCLB mandates affect instructional priorities.”</td>
<td></td>
</tr>
</tbody>
</table>

The program does not explicitly address the instructional role of standardized tests, or it addresses standardized tests other than the state’s tests. Examples:

| Lecture entitled “**National and International Assessment Data**.” |
| Lecture entitled “**Standardized Assessment**” in an Educational Psychology course. |
| Lecture entitled “**Large scale tests, issues, and interpretation**.” |

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6 The specificity of this assignment (in its reference to “AYP”) allows the analyst to presume that instruction in coursework prepares the candidate on the topic of the state’s standardized tests even though no lecture on the topic was evident.
## Preparation of formative and summative assessments (Indicator 12.2)

<table>
<thead>
<tr>
<th>✔ - fully satisfies the indicator</th>
<th>✘ - does not satisfy the indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>The program requires teacher candidates to prepare both formative and summative assessments.</td>
<td>The program requires the teacher candidate to prepare either formative or summative assessments (not both), or to prepare neither.</td>
</tr>
<tr>
<td>Examples:</td>
<td>Examples:</td>
</tr>
</tbody>
</table>
| Teacher candidates prepare a unit plan using the Understanding by Design (UbD) framework.  
Capstone project requires a full assessment plan, including a pre/post-test and several formative assessments.  
Assignment entitled Thematic Unit requires several unspecified assessments. (These are interpreted to include practice relevant to this indicator because the syllabus lists requirements that include the development of formative, summative and authentic assessments.) | Teacher candidates are required to conduct an informal, formative interview to determine a student’s baseline knowledge of fractions, but the course assignments do not include a follow-up inventory of knowledge gained post-instruction.  
Capstone project requires the use of formative and summative assessments; however, the assessments need not be prepared by the teacher candidate. |

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7 Use of the UbD planning format presumes use of formative assessment; preparation of a unit plan is always presumed to entail preparation of a summative assessment.
**Individual and team analysis and interpretation of data (Indicator 12.3)**

Note that this indicator requires that teacher candidates work with both classroom and standardized assessment data, both individually and with their peers.

<table>
<thead>
<tr>
<th>✔ - fully satisfies the indicator</th>
<th>~ - partly satisfies the indicator</th>
<th>✘ - does not satisfy the indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>The program requires teacher candidates, individually and in teams, to analyze and interpret classroom and standardized assessment data in order to inform instruction.</td>
<td>The program partly satisfies this indicator because teacher candidates do some combination that constitutes the majority of the activities required by this indicator.</td>
<td>The program does not satisfy this indicator because teacher candidates do none or only a few of the activities required by this indicator.</td>
</tr>
</tbody>
</table>

**Example:**

A course requires teacher candidates to bring in **standardized and classroom assessment** samples and data from their field classrooms **for in-class analysis and discussion of instructional implications**. The capstone project in the same program requires teacher candidates to conduct **individual analyses of classroom and standardized assessment data as well as reflect on the instructional implications of those assessment results**.

**Example:**

A TWS requires that teacher candidates **individually use classroom assessment data** to analyze the impact of instruction on student learning “in terms of number of students who achieved and made progress toward each learning goal.” It must also be evident that the teacher candidate used pre-assessment data to modify instruction and reflected on changes he or she might make in the future based on post-assessment data. Teacher candidates must **present to their peers their classroom assessment data analysis and implications for future instruction for feedback and discussion**.

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8 Assignments counted as practice for Indicators 12.2 and 12.3 cannot simply involve a teacher candidate writing reflectively about assessments developed or assessment data analyzed; they must involve the tangible product of an assessment or the analysis itself, products that can be submitted for instructor review. However, an assignment involving a written reflection that specifically discusses the instructional implications of assessment data can be counted as a practice assignment even if there is no implementation of instruction.
Research Inventory

Researching Teacher Preparation:
Studies investigating the skills and techniques teachers need for assessing students and analyzing data

*These studies address issues most relevant to Standard 12: Assessment and Data*

<table>
<thead>
<tr>
<th>Total Number of Studies</th>
<th>Studies with Stronger Design</th>
<th>Studies with Weaker Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measures Student Outcomes</td>
<td>Does Not Measure Student Outcomes</td>
</tr>
<tr>
<td></td>
<td>Does Not Measure Student Outcomes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Citations: 7, 24</td>
<td></td>
</tr>
</tbody>
</table>

Citations for articles categorized in the table are listed below.

**Databases:** Education Research Complete and Education Resource Information Center (peer-reviewed listings of reports on research including United States populations).

**Publication dates:** Jan 2000 – June 2012

See *Research Inventories: Rationale and Methods* for more information on the development of this inventory of research.


