Understanding Our Secondary Methods Standard

The program requires teacher candidates to practice instructional techniques specific to their content area.

WHY THIS STANDARD?

It is one thing to know a subject and quite another to teach it. Beyond knowing content, candidates should have skills related to how to introduce content to students. Best practices differ among content areas, so methods courses should be tailored to a candidate's chosen subject area.

WHAT IS THE FOCUS OF THE STANDARD?

We evaluate whether secondary teacher candidates receive instruction on pedagogy related to their content area and have the opportunity to practice these skills in a classroom.

Standard applies to: Secondary programs.

Standard and Indicators

Standard 15: Secondary Methods

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Standard applies to: Secondary programs.

This standard has been modified since 2014. Rather than evaluating the methods coursework for one randomly selected route in each secondary program (English, mathematics, the sciences, or the social sciences), the analysis now evaluates methods coursework for both English and mathematics routes in each secondary program. For more information, see here.

Indicators that the program meets the standard:

15.1 The program requires teacher candidates to take a subject-specific methods course in the area of certification.

AND

15.2 Secondary mathematics and English/language arts methods courses focus on specific instructional strategies that will improve the delivery of content and that include field work or a concurrent practicum that holds teacher candidates individually accountable for mastering instructional skills.

Rationale

Standard 15: Secondary Methods

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RATIONALE

Research base for this standard

Little "strong research"[1] exists on this topic. However, a strong study in Germany looking at the relative effects of different components of teacher education, including pedagogical content knowledge (PCK) (e.g., methods to effectively teach math) found that "it is PCK that has greater predictive power [than content knowledge] for student progress and is decisive for the quality of instruction."[2]

An additional research study[3] of high school math and science teachers found that teachers' pedagogical coursework positively correlated with students' achievement, and in some cases this pedagogical background yielded greater effects than their content knowledge.[4] These studies demonstrate that teachers must have a firm basis in content knowledge and pedagogical techniques specific to that content to teach a subject effectively.

Other support for this standard

Teacher preparation programs in high-achieving nations frequently ensure that teachers not only know the content but also can communicate it. Mathematics-specific pedagogy is part of the preparation of mathematics teachers around the world, including in countries such as Singapore, Korea and Taiwan, whose students outperform our own.[5]

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 Baumert, J., et al. (2010). Teachers' mathematical knowledge, cognitive activation in the classroom, and student progress. *American Educational Research Journal, 47*(1), 133-180.

3 "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.

4 Monk, D. (1994).

5 Communications with Mdm. Low Khah Gek. (2008, March). Deputy Director, Sciences, Curriculum Planning and Development Division, Ministry of Education, Singapore.

Like teaching lesson planning, teaching pedagogical skills is one of the central tasks of a teacher preparation program. While some components of teaching may be universal across all subjects, many techniques and strategies are specific to a content area. Therefore it is essential that teacher preparation programs teach these skills to teacher candidates, who are expected to practice them through assignments and eventually implement them in the field.

School district superintendents also support this standard.

Methodology

How NCTQ scores the Secondary Methods Standard

Standards and Indicators

DATA USED TO SCORE THIS STANDARD

Evaluation of secondary teacher preparation programs under Standard 15: Secondary Methods uses the following sources of data:

- Course requirements and descriptions found in institution of higher education (IHE) catalogs
- Degree plans provided by IHEs
- Syllabi of required courses deemed relevant[6]

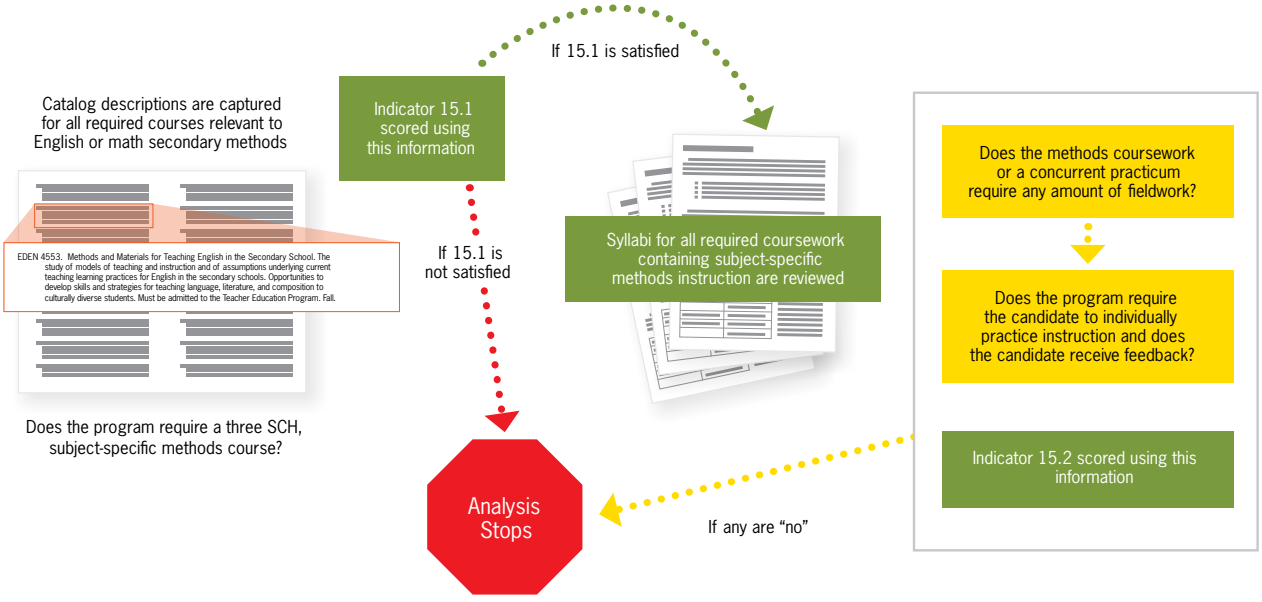
WHO ANALYZES THE DATA

A general analyst evaluates each program using a detailed scoring protocol from which this scoring methodology is abstracted. Twenty percent of programs are randomly selected for analysis by a second general analyst. For information on the process by which scoring discrepancies are resolved, see the "scoring processes" section of the General Methodology.

SCOPE OF ANALYSIS

Analysis under this standard focuses on the required methods coursework for both the English and mathematics teacher certification majors in the **undergraduate** or **graduate** secondary program being evaluated.[7] If a program offers only English or mathematics, but not both, analysis is completed using the one major. If a program offers neither English nor mathematics, the coursework for the secondary biology or general science teacher certification major is evaluated.

The following graphic depicts the general evaluation approach used for this standard.



6 Courses relevant to this standard have course titles and/or descriptions that indicate coverage of instructional methods with terms such as methods, instructional strategies, techniques, materials, and teaching. Most often, these terms are accompanied by a subject area, as in Teaching English or Instructional Strategies in Secondary Mathematics.

7 Refer to the General Methodology for more information about secondary program selection principles.

For both **undergraduate** and **graduate** programs, Indicator 15.1, which evaluates whether the program requires a subject-specific methods course for both the English teacher certification major and the math teacher certification major, is evaluated using course titles and descriptions in catalogs. More discussion of evaluation using coursework descriptions is found here; more discussion of analysis using syllabi is found here.

Analysis focuses on whether secondary programs require a three-semester credit hour (SCH) subject-specific course in the methods of instruction in the relevant subject area. General methods courses[8] and subject-specific courses with fewer than three SCHs[9] do not satisfy this indicator. If Indicator 15.1 is satisfied, analysis continues to Indicator 15.2. In cases in which Indicator 15.1 is not satisfied, there is no further analysis of the program.[10]

Indicator 15.2 evaluates whether candidates practice teaching in a high school classroom relevant to the certification sought and receive direct feedback from a content expert. This indicator is evaluated using syllabi for all courses that satisfy Indicator 15.1, as well as for any practicums taken concurrently with subject-specific methods coursework. Analysis of the following criteria proceeds sequentially, and the certification major does not satisfy the indicator if either of the criteria below is not satisfied:

- *Does the certification major require fieldwork as part of the subject-specific methods course or a concurrent practicum?* Analysts look for evidence that teacher candidates spend time in a secondary classroom.
- *Does the methods course or concurrent practicum require the teacher candidate to individually practice instruction and receive feedback on that teaching experience?* The teaching experience must take place in a classroom of students relevant to the certification sought (e.g., a teacher candidate seeking secondary math certification would practice teaching in a high school math class) and must be for full-class instruction (not tutoring or small group instruction).[11] Feedback can be in the form of any kind of evaluation for which the teacher candidate is observed teaching a whole class.

If an evaluation of Indicator 15.2 is not possible due to a missing or incomplete syllabus, a score of "cannot be determined" (CBD) is given.

The scores for Indicators 15.1 and 15.2 are reported independently. For each indicator, the final score is based on the average of the English and mathematics certification major scores. Full analysis of both majors is always completed under Indicator 15.1. If one of the majors is not offered or is removed from analysis due to missing syllabi, the score under 15.2 is based on the major that was fully evaluated. If both majors cannot be scored because of missing syllabi, the program receives a final score of CBD under Indicator 15.2.

Common misconceptions about how analysts evaluate the Secondary Methods Standard:

- *General methods coursework is equivalent to content-specific methods coursework.* These two types of coursework are not considered equivalent in evaluation because a teacher candidate receiving methods instruction specific to his/her content area will be better prepared for the secondary classroom than one prepared by general secondary methods instruction.
- *A program can receive credit for an optional teaching experience offered in conjunction with a methods course.* Only a required teaching experience receives credit in evaluation of this standard.
- *Any teaching experience "counts" in evaluation of this standard:* The only teacher experience considered in evaluation is whole-class instruction for which feedback is provided.

8 Courses lacking subject specificity–for example, Methods of Secondary Instruction, as opposed to Methods of Secondary Mathematics.
9 Except when the sum of credits entailed in a methods course and a corequisite practicum course total three or more SCHs.
10 In such instances, findings for Indicator 15.1 and Indicator 15.2 will indicate that neither is satisfied.
11 Peer teaching, or micro-teaching (a common requirement of many methods courses) does not satisfy this aspect of Indicator 15.2

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

Requirement of a subject-specific methods course (Indicator 15.1)

✓ satisfies the indicator	X does not satisfy the indicator
A major satisfies the indicator if it requires: ■ A single course or a combination of courses that provides at least three SCHs of subject-specific methods instruction. ■ A combination of a two SCH, subject-specific course in the methods of content instruction, plus a concurrent one SCH practicum.	A major does not satisfy the indicator if it requires: ■ Only a course in the general methods of secondary instruction. ■ A subject-specific course in the methods of content instruction requiring fewer than three SCHs or addressing methods in only one aspect of the relevant content area (for example, an English methods course that only addresses the methods of literature instruction and not methods of teaching writing).

Subject-specific instructional practice and feedback (Indicator 15.2)

✓ satisfies the indicator	X does not satisfy the indicator
A major satisfies the indicator if the syllabus for the subject-specific methods course: Requires fieldwork and specifies that teacher candidates must teach a lesson in a classroom appropriate to the subject and grade level for the relevant certification, and that the teaching experience is evaluated through one of the following: ■ A formal evaluation (graded or ungraded) by either the supervising teacher or a university supervisor: *During the course of your time in a school classroom, you will prepare and teach two days (consecutive is best). Your cooperating teacher and I will evaluate your lesson plans, and the cooperating teacher will evaluate your teaching.* ■ Analysis of a videotaped lesson by an audience, including either the supervising teacher or university supervisor (graded or ungraded): *Each student will be required to tape a 15-30-minute segment of classroom teaching. We will view the video and provide a critique. After the roundtable critique, each student will write a summary of the roundtable with suggestions for improving his or her teaching.*	A major fails to satisfy the indicator if the syllabus for the subject-specific methods course: Does not indicate that a fieldwork experience is required, or requires a fieldwork experience for a subject and/or grade level not appropriate to the certification sought. OR Does not indicate that there will be a teaching experience or that the candidate will not receive formal or graded feedback from that experience, as in the following examples: ■ As part of this course, you are required to complete 10 hours of field observations and submit brief written and oral reflective reports. ■ You are strongly encouraged to participate in teaching in the classroom at whatever level your mentor teacher allows (working with students one-on-one, teaching lessons, planning lessons, taking attendance, recording grades, reflecting on lessons, etc.). ■ Forty-five hours of fieldwork is required. ■ You will participate in a 30-hour field experience and write a report that summarizes this experience. This report must include documentation of your field experience visits and signatures of your cooperating teacher(s). ■ You are required to spend 30 hours in observation of a high school classroom and to keep a reflective journal of your observations.

Research Inventory

Researching Teacher Preparation: Studies investigating the preparation of teacher candidates in secondary methods

These studies address issues most relevant to Standard 15: Secondary Methods

Total number of studies	Studies with stronger design		Studies with weaker design	
	Measures student outcomes	Does not measure student outcomes	Measures student outcomes	Does not measure student outcomes
12	1	2	0	9
	Citation: 1	Citations: 5, 7		Citations: 2-4, 6, 8-12

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 – March 2017

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

1. Baumert, J., Kunter, M., Blum, W., Brunner, M., Voss, T., Jordan, A., &…Tsai, Y. (2010). Teachers' mathematical knowledge, cognitive activation in the classroom, and student progress. *American Educational Research Journal, 47*(1), 133–180.
2. Berg, D. E. (2010). Creative mathematics for all? A survey of preservice teachers's attitudes. *International Online Journal of Educational Sciences, 2*(2), 309–318.
3. Conklin, H. G. (2007). Methods and the middle: Elementary and secondary preservice teachers' views on their preparation for teaching middle school social studies. *RMLE Online: Research in Middle Level Education, 31*(4), 1–16.
4. Conner, A., Edenfield, K. W., Gleason, B. W., & Ersoz, F. (2011). Impact of a content and methods course sequence on prospective secondary mathematics teachers' beliefs. *Journal of Mathematics Teacher Education, 14*(6), 483–504.
5. Depaepe, F., Torbeyns, J., Vermeersch, N., Janssens, D., Janssen, R., Kelchtermans, G., & … Van Dooren, W. (2015). Teachers' content and pedagogical content knowledge on rational numbers: A comparison of prospective elementary and lower secondary school teachers. *Teaching and Teacher Education, 47*, 82-92.
6. Gal, H. (2011). From another perspective—training teachers to cope with problematic learning situations in geometry. *Educational Studies in Mathematics, 78*(2), 183–203.
7. Kleickmann, T., Richter, D., Kunter, M., Elsner, J., Besser, M., Krauss, S., & … Baumert, J. (2015). Content knowledge and pedagogical content knowledge in Taiwanese and German mathematics teachers. *Teaching and Teacher Education, 46*, 115-126.

8. Johnson, D., & Chandler, F. (2009). Pre-service teachers' fieldtrip to the battleship: Teaching and learning mathematics through an informal learning experience. *Issues in the Undergraduate Mathematics Preparation of School Teachers, 2*.
9. Munakata, M. (2010). The mathematics education debates: Preparing students to become professionally active mathematics teachers. *Primus, 20*(8), 712–720.
10. Russell, W. (2010). Teaching social studies in the 21st century: A research study of secondary social studies teachers' instructional methods and practices. *Action in Teacher Education, 32*(1), 65–72.
11. Star, J., & Strickland, S. (2008). Learning to observe: Using video to improve preservice mathematics teachers' ability to notice. *Journal of Mathematics Teacher Education, 11*(2), 107–125.
12. Wellenreiter, B. R., Lucey, T. A., & Hatch, D. D. (2010). Looking back at their futures: Preservice middle level teachers' examination of past educational experiences. *RMLE Online: Research in Middle Level Education, 34*(1), 1–11.

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