Appendix B:
Methodology to analyze grade differences as revealed by honors

Data used for analysis

To evaluate the undergraduate teacher preparation programs (generally including elementary, secondary, and special education programs) within an institution of higher education, we used the following sources of data:

a. To identify students' majors and honors status: commencement brochures and graduation lists from spring graduation ceremonies.

b. To distinguish between single and double majors: course catalogs and websites.

c. To gather information about the institutional home of teacher preparation programs: course catalogs and websites.

Who analyzes the data

A general analyst evaluated data for each institution using a detailed scoring protocol. For a randomly selected sample of 10 percent of institutions, a second analyst repeated the analysis. Any scoring discrepancies were resolved using NCTQ's standard protocol for scoring differences, described in the "scoring processes" section of the *Teacher Prep Review's* general methodology.

Scope of analysis

To determine the rigor of teacher preparation programs compared with all undergraduate academic disciplines on the same campus, this analysis compares the proportion of undergraduate teacher candidates earning honors (generally Latin honors such as *cum laude*, *magna cum laude* or *summa cum laude*) relative to the proportion of all undergraduates earning honors at that institution at spring graduation.[1] It does not compare the proportion of teacher candidates earning honors to any single, absolute value that is defined as acceptable or optimal. Although the data source does include information about individual students, all data were publicly available and were aggregated to the program level so that no individual's identity is revealed.

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1   The comparison is between teacher candidates and *all* graduating undergraduate students, inclusive of teacher candidates.

When possible, all non-spring graduating students were removed from the analysis because their grades and levels of honors might systematically differ from students graduating in the spring in some unidentifiable way. Analysts also omitted any education majors whose certification would require post-baccalaureate coursework. Students with multiple majors were counted once per major because each major's coursework can have a significant impact on GPAs used to determine honors designations.

An institution's teacher preparation programs are identified as having disproportionately high honors if the proportion of teacher candidates earning honors is 10 or more percentage points greater than the proportion of all undergraduates earning honors. Any GPA differential greater than or equal to 10 percentage points is considered unacceptable and signals an absence of rigor in that teacher preparation program. (We note that this differential is identical to what is termed the "honors differential" in the main body of the report.)

Data Source

Our primary data source comprises commencement brochures or graduation lists that meet the following criteria: 1) undergraduate students are identified as graduating from a teacher preparation program, department of education, or similar entity, and 2) honors designations based on grade point average (GPA) are identified for individual students.

If a key piece of information was missing and could not be obtained after the institution was contacted by NCTQ staff, the institution was removed from the sample.[2] Any institution with fewer than 20 graduating teacher candidates was automatically removed from the sample to ensure that its programs' performance could not be attributed to any individual candidates.[3]

We note that commencement brochures often have to be printed prior to the end of the semester so that they are ready for commencement ceremonies. They frequently contain a caveat that the information contained within their pages is not final and does not constitute proof of graduating. As a result of early printing, the indications of Latin honors are frequently based on students' GPAs prior to the final semester. We did not consider this factor to be a methodological problem because it is true for all graduating students in the analysis. Furthermore, the last semester for most teacher candidates is the student teaching experience, which is often graded as a Pass/Fail course with the Pass translated by institutions as an "A" grade. If anything, including the last semester in GPA calculations might have actually increased the GPA differential for teacher candidates.

How documents are evaluated for the analysis of honors differences

Categorization of teacher candidates and all other graduates

Teacher preparation programs can be housed in a wide range of organizational structures. For example, secondary education teacher candidates' majors may be housed within the education college or the liberal arts college. In roughly half of the institutions analyzed, commencement brochures clearly identify all teacher candidates (we refer to this as providing "precise data"). In others, a combination of less detailed information in the commencement brochure and differing structures of the teacher preparation program result in our analysis relying on "less precise data."[4]

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2 We collected 316 commencement brochures that we could not evaluate due to missing information.

3 We collected 120 commencement brochures that we could not evaluate because fewer than 20 teacher candidates could be identified in each brochure.

4 This distinction does not mean that any of the data are *inaccurate*, just that the institutions with "less precise data" offer information at a broader level, and lack some of the distinctions about students' majors and certifications that the commencement brochures for institutions with "precise data" offer.

To accommodate these variations, NCTQ developed two approaches to evaluate institutions. When institutions' commencement brochures offered less precise data, we based the evaluation on those students graduating from the education department (or similar entity). This approach was generally necessary when the commencement brochure did not identify individual student majors or when some types of teacher candidate (most commonly secondary education candidates) were not labeled as such.

If precise data were available, teacher candidates were coded as elementary education, special education, core secondary education (e.g., English education), or non-core education (e.g., art education, physical education) and (with the exclusion of non-core teacher candidates) broadly grouped as "teacher candidates." Majors that were housed in the College of Education but were not teacher preparation majors were coded as "education college non-teacher candidates" and were not included in the "teacher candidates" category. All students with majors unrelated to teacher preparation or the education school in general were coded as "other students."

When commencement brochures offered less precise data, candidates were coded according to more general categories. These categories were based on the most specific available "unit of analysis" in which candidates can be grouped, such as an education department, education college, or education-specific degree.

The seven scenarios appearing later in this appendix depict representative institutional types and the approach to analysis used for each.

Comparison of effects of two different analysis approaches

To compare the effects on analysis of these two different approaches, we looked at a subsample of 50 institutions for which precise data were available to determine how much their GPA differential would vary if we proceeded as if the data were not available. Thus, we recoded the data for each institution as if we could not identify individual teacher candidates, and instead categorized them based on their department or other available data. Using a chi-square test, we found the similarity in our final results was highly statistically significant ($p<0.001$): Institutions that had an unacceptable GPA differential when teacher candidates were identifiable almost all had an unacceptable GPA differential when analyzed using less precise data, and all institutions that had acceptable GPA differentials when coded based on precise data also had acceptable GPA differentials when categorized based on less precise data.

In summary, compared to their ratings with precise data, when rated with less precise data institutions only performed better, not worse. Based on these results, we conclude that the findings based on less precise data are actually quite conservative in their measure of GPA differentials.

Coding of graduating students receiving honors

Graduating students were coded as having received honors at graduation based primarily on Latin honors, but any honors designations based on cumulative GPA or being within the top specified percent of the graduating class was accepted. Honors designations based on criteria other than GPA or derivatives of GPA (e.g., honors for taking honors courses, writing a thesis, or entering into an honors society) were not considered. No distinctions were made among different levels of honors.

Representative institutional types and approach to analysis used for each

Scenarios 1-7 depict how we identify all candidates with elementary, secondary, or special education majors or certifications. The units of analysis in each figure one shown in yellow.

Scenario 1: Precise data, all teaching majors are within the Department of Education

All teaching majors are identified as such in the commencement brochure and are housed within a Department of Teacher Education in the College of Education.
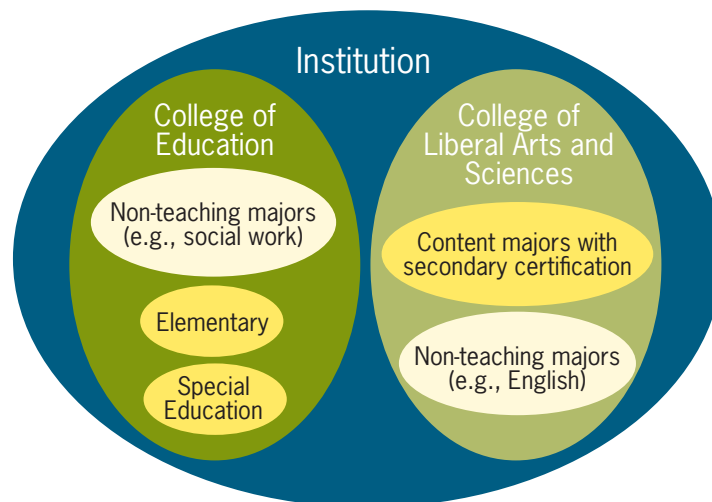
Explanation: The unit of analysis for calculating the GPA differential is based on all candidates (and only those candidates) who major in elementary, secondary, or special education.

Institution

College of Education

Department of
Teacher Education

Elementary

Secondary

Special
Education
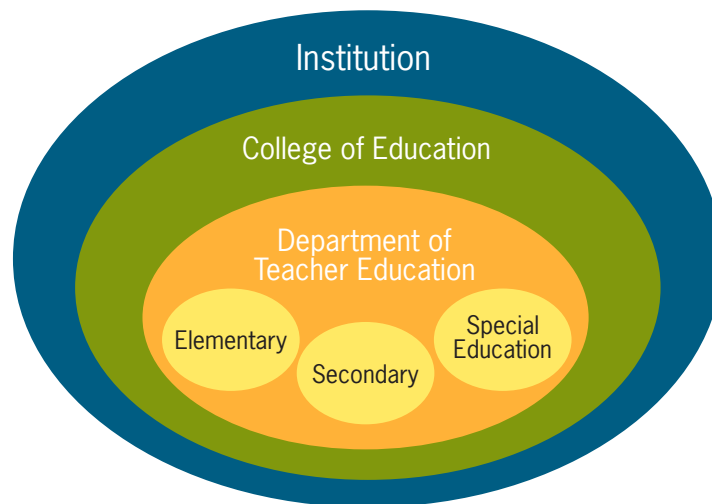
Scenario 2: Precise data, teaching majors are in multiple colleges within the institution

Some core teaching majors are housed in the College of Education and other candidates are housed in the college that contains their content major. All teaching candidates are identified as such in the commencement brochure.

Explanation: The GPA differential calculation is based on all candidates with elementary and special education majors and candidates obtaining secondary certification.

Institution

College of
Education

College of
Liberal Arts and
Sciences

Non-teaching majors
(e.g., social work)

Content majors with
secondary certification

Elementary

Non-teaching majors
(e.g., English)

Special
Education

Scenario 3: Less precise data, Department of Teacher Education within College of Education

Some teacher candidates are housed in a department within the College of Education and others are housed in the College of Arts and Sciences. Students are grouped by department in the commencement brochure but majors are not identified.

Explanation: Because the institution houses education majors within the Department of Teacher Education and because we can be reasonably confident that the students in that department are teacher candidates, we use the Department of Teacher Education as the unit of analysis for the GPA differential calculation. Consequently, the calculation of the GPA differential does not include consideration of any graduating candidates with secondary education certification. If any non-teacher preparation majors (e.g., education policy) are also housed within the Department of Teacher Education, the students with those majors are included in the calculation of the GPA differential.
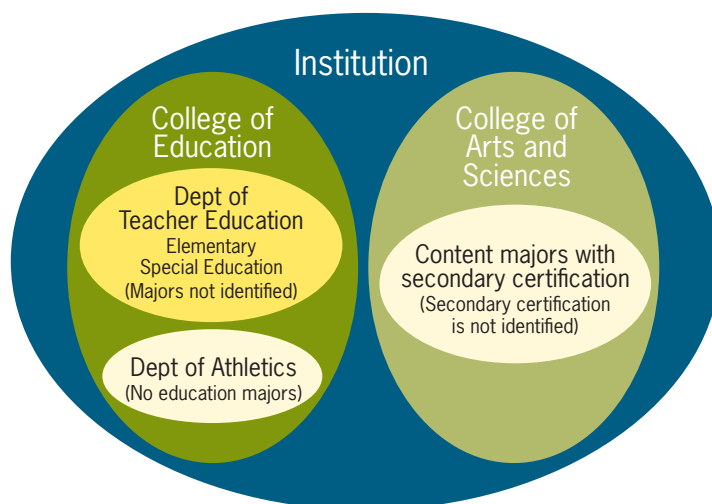
Scenario 4: Less precise data, College of Education

Teacher preparation majors are housed in the College of Education. The commencement brochure groups students according to college and does not label majors.

Explanation: The clearest grouping of teacher candidates is in the College of Education and Human Development, and so this becomes the unit of analysis for the GPA differential. The calculation includes both teaching and non-teaching majors housed in that college, and excludes candidates obtaining teaching certifications whose majors are housed in other departments.
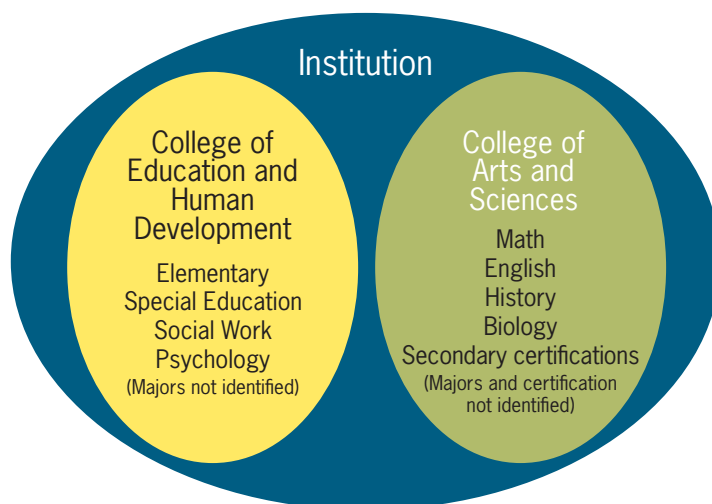
Scenario 5: Less precise data, multiple departments within the College of Education

Teacher preparation majors are housed both within multiple departments in the College of Education and outside of the College of Education. Although students' departments are labeled in the commencement brochure, students' majors are not.
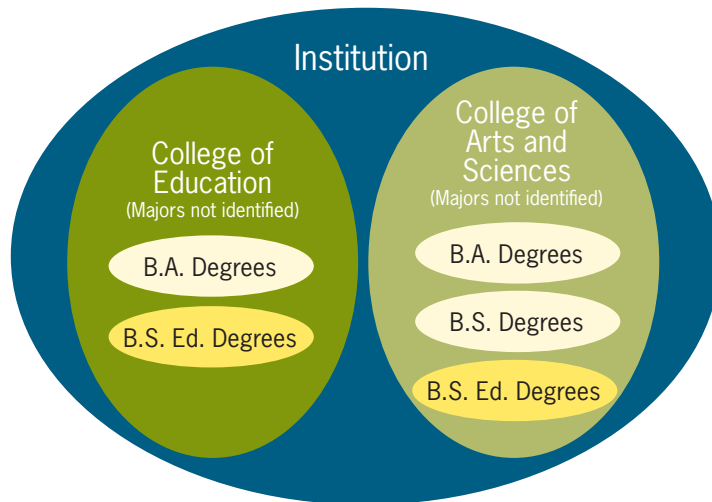
Explanation: The unit of analysis for the GPA differential includes students in those departments within the College of Education that house teacher preparation programs (the Department of Curriculum and Instruction and the Department of Counseling and Special Education), but excludes students graduating from departments that do not house any core teacher preparation programs (the Department of Health Sciences).
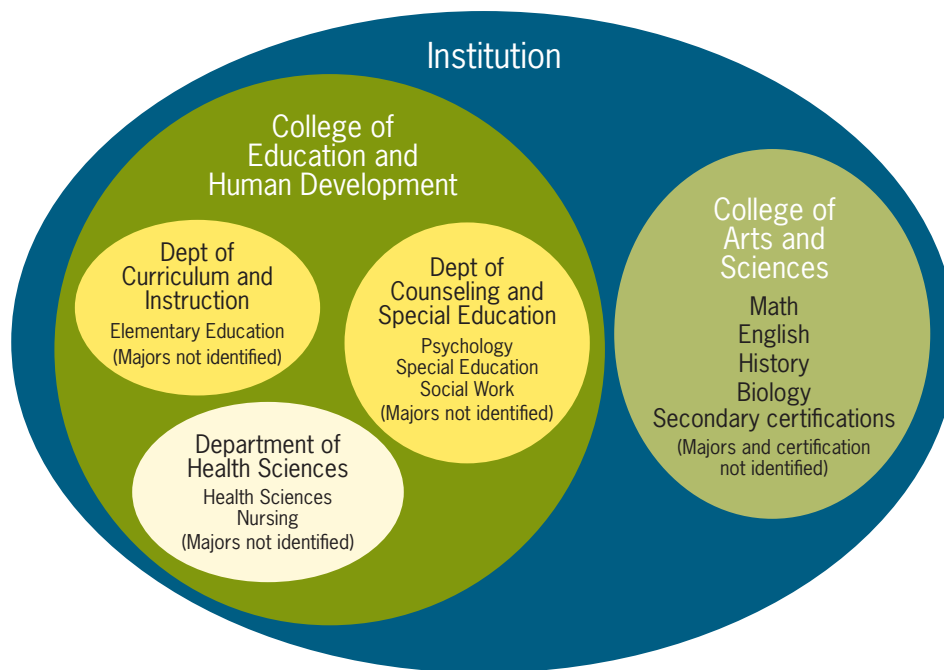
Scenario 6: Less precise data, B.S. in Education

Students are grouped by degree type in the commencement brochure. Teacher candidates have earned a Bachelor of Science in Education (B.S.Ed.) leading to certification in elementary education, middle grades education, and special education, and may be housed in several different departments. In this figure, teacher candidates earning a B.S.Ed. degree for elementary and special education are housed in the College of Education, while teacher candidates earning a B.S. Ed. for middle grades education are housed with their respective content departments in the College of Arts and Sciences. Teacher candidates seeking secondary certification earn a content area major with a Bachelor of Arts or Bachelor of Science degree and are not identified as education graduates in the commencement brochure.

Explanation: The unit of analysis for the GPA differential is the teacher candidates receiving a Bachelor of Science in Education degree, which is the most common degree granted to students earning teaching certifications.

Institution

College of Education
(Majors not identified)

B.A. Degrees

B.S. Ed. Degrees

College of Arts and Sciences
(Majors not identified)

B.A. Degrees

B.S. Degrees

B.S. Ed. Degrees

Scenario 7: Less precise data, Teacher Certification

Students' names are displayed in one list in the commencement brochure. Students who have earned a teaching certification are identified in the commencement brochure with a symbol or in a separate list. Teacher candidates major in any number of subject areas which are not identified in the commencement brochure, and earn teaching certifications in elementary, secondary, or special education, but the type is not specified.

Explanation: The unit of analysis for the GPA differential includes all candidates who have earned a teaching certification. Since majors are not identified, this includes both core (elementary, secondary and special education) and non-core teaching candidates (e.g., art education and physical education majors).

Institution
(Majors not identified)

Teaching Certification identified with an * or other symbol