

# Out-of-Field Teaching Memo

**Date:** July 18, 2000  
**To:** PEN and Local Education Fund Staff Members  
**From:** Craig Jerald, Education Trust  
**Re:** Critical questions about out-of-field teaching data

How bad is the problem of out-of-field teaching? That depends on how extensive the practice is, which, in turn, depends on how the phenomenon is defined and measured. Many states do not believe they have a problem with out-of-field teaching because state officials define it in ways that make it look virtually non-existent. Districts can “define away” the problem as well.

The questions below are crucial for interpreting data relating teachers’ assignments to their field(s) of study. However, the list should not be treated as exhaustive. It is based primarily on my understanding of out-of-field statistics constructed from the federal Schools and Staffing Survey, and local education funds are sure to encounter a wider range of definitional idiosyncrasies than the following questions can encompass.

(I should point out that I am indebted to Richard Ingersoll of the University of Pennsylvania for my understanding of the definitional issues related to out-of-field teaching.)

**I. Range of assignments.** Some out-of-field statistics consider only a teacher’s main assignment. However, given that some secondary teachers are responsible for math classes in the morning, English classes after lunch, and a history class thrown in at the end of the day, it is often a good idea to consider the teacher’s secondary or full range of assignments.

**KEY QUESTION:** How many teaching assignment(s) does the statistic take into account?

- Main teaching assignment only
- Main teaching assignment and secondary teaching assignment
- All teaching assignments

Keep in mind that while the first option probably hides some crucial out-of-assignment instruction, the third is rather unforgiving. For instance, a middle school, short in the PE department, might ask a seventh-grade pre-algebra teacher who teaches four sections of that subject to take a PE class at the end of the day.

**II. Types of assignments.** Some statistics are based on the full range of subjects, while others are restricted only to “academic” fields. The definition used by the National Education Goals Panel in its annual report includes “only secondary school teachers whose main assignment was in mathematics, science, English, social studies, fine arts, foreign language, and special education.” The Goals Panel *aggregates* these into one out-of-field teaching statistic. Of course, this question becomes less important if one is considering multiple statistics, each of which deals with a different field.

**KEY QUESTION:** What range of teaching assignment fields does the statistic take into account?

- Core academic subjects only
  - Aggregated
  - Calculated separately
- Core academic subjects plus fine arts and foreign languages
  - Aggregated
  - Calculated separately
- All secondary teaching assignments, including everything from shop to PE
  - Aggregated
  - Calculated separately
- Some other configuration
  - Aggregated
  - Calculated separately

Most out-of-field statistics focus on the core academic subjects, while some are more inclusive. Almost none include *every* assignment field, since insisting that an industrial arts teacher should have majored in industrial arts education rather than in mathematics, for instance, is not as easy as insisting that a calculus teacher should not have majored in industrial arts education.

**III. Grade levels.** Some statistics include middle school teachers, while others consider only high school. Since out-of-field teaching is much more pervasive in the middle grades, this question can have a large impact on how bad the problem appears to be, statistically speaking. Five years ago there was real debate about whether middle school teachers should be included in out-of-field teaching calculations; many people still believed that other qualifications were more important for teaching adolescents, and that the content wasn't that rigorous anyway. However, as states have set higher academic standards in the middle grades, and new research has been published confirming the link between teachers' subject knowledge and student achievement, definitions including middle school teachers have become more widely accepted.

**KEY QUESTION:** Which grades or grade levels are included in the statistic?

- High school only
  - Defined as "high school"
  - Defined as grades 9–12
- High School and junior high/middle school, often described as "secondary"
  - Defined as "high school" and "middle school"
  - Defined as grades 7–12
  - Defined as grades 6–12
  - All departmentalized classes in grades X–12
- All departmentalized instruction

The last would seem to be the most rigorous, but, again, keep in mind the diminishing returns on definitional rigor: Some people will think it's going overboard to get as indignant about elementary art teachers as high school calculus teachers.

**IV. College major or minor.** Some statistics consider teachers to be “in-field” only if they earned a major in a particular subject. Others count minors as well. This is a key distinction and can make a big difference in out-of-field teaching statistics. For example, according to the National Center for Education Statistics, only 65 percent of secondary mathematics teachers in Texas held a *major* in math in 1994; but 87 percent were teaching in field if that is defined as holding a *major or minor* in math. While some people prefer the more rigorous definition on principle, the research suggests there's no cut-and-dried benchmark for subject-matter study. In fact, some studies refute the “more is better” school by suggesting that there's a diminishing return on subject-study investment past a certain point. Of course, research on this topic is complicated by the reality that a minor at one university might be more rigorous than a major at another.

**KEY QUESTION:** Which degree levels count for teaching in field?

- Major only
- Major or minor, often called simply “degree”

**V. Dual degrees, later degrees, and graduate degrees.**

**KEY QUESTION:** Does the statistic “know enough” about the teachers in question to take into account degrees they might hold other than their primary bachelor's degree?

- Second bachelor's degrees
  - Obtained later in career
  - Obtained during initial undergraduate study
- Graduate degrees
  - Master's degrees
  - Professional degrees
  - Doctorates

**VI. Unit of analysis.** As simplistic as this sounds, it's important to keep in mind that out-of-field statistics expressed as percentages are just mathematically morphed fractions: numerators divided by denominators. Thus, one important question has to do with what exactly “it” is that is being divided. Out-of-field *teachers* by total *teachers*? *Students* who have out-of-field teachers divided by total *students*? The number of *classes* (for example, seventh-period English) taught by an out-of-field teacher divided by total *classes*?

**KEY QUESTION:** What is the unit of analysis?

- Teachers
- Students
- Classes taught by teachers (this can also be expressed as “percentage of teachers' class schedules”)
- Classes taken by students (this can also be expressed as “percentage of students' class schedules”)

Of course, it's important to keep in mind that out-of-field teaching figures needn't always take the form of percentages. Sometimes it's just as powerful to publish the *number* of students being taught by teachers working outside their areas of expertise.

**VII. Subfields.** Is a teacher with a major or minor in chemistry who teaches a biology class counted as teaching in field? After all, chemistry and biology are both sciences. Some statistics treat subject-area fields rather broadly (e.g., “science,” “social studies”), while others embody more rigorous expectations. Additionally, some statistics count subject-specific education majors while others do not. For instance, does a degree in “math education” count for teaching in field? Once again, the appropriateness of one or the other depends on one’s values and/or interpretation of the research.

**KEY QUESTION:** What majors “count” for teaching in field?

<p><b>Math</b></p> <p><input type="checkbox"/> Mathematics</p> <p><input type="checkbox"/> Economics</p> <p><input type="checkbox"/> Statistics</p> <p><input type="checkbox"/> Engineering</p> <p><input type="checkbox"/> Math Education</p> <p><input type="checkbox"/> Other</p>	<p><b>English/Language Arts</b></p> <p><input type="checkbox"/> English</p> <p><input type="checkbox"/> Journalism</p> <p><input type="checkbox"/> Communications</p> <p><input type="checkbox"/> Semiotics</p> <p><input type="checkbox"/> English Education</p> <p><input type="checkbox"/> Other</p>
<p><b>Social Studies</b></p> <p><input type="checkbox"/> History</p> <p><input type="checkbox"/> Sociology</p> <p><input type="checkbox"/> American Studies</p> <p><input type="checkbox"/> Economics</p> <p><input type="checkbox"/> Political Science/Government</p> <p><input type="checkbox"/> Psychology</p> <p><input type="checkbox"/> Social Studies Education</p> <p><input type="checkbox"/> Other</p>	<p><b>General Science</b></p> <p><input type="checkbox"/> Biology/Life Science</p> <p><input type="checkbox"/> Chemistry</p> <p><input type="checkbox"/> Geology/Earth Science</p> <p><input type="checkbox"/> Physics</p> <p><input type="checkbox"/> Science Education</p> <p><input type="checkbox"/> Other</p>
<p><b>Biology</b></p> <p><input type="checkbox"/> Biology/Life Science</p> <p><input type="checkbox"/> Chemistry</p> <p><input type="checkbox"/> Geology/Earth Science</p> <p><input type="checkbox"/> Physics</p> <p><input type="checkbox"/> Science Education</p> <p><input type="checkbox"/> Other (Nutrition? Psychobiology?)</p>	<p><b>Chemistry</b></p> <p><input type="checkbox"/> Biology/Life Science</p> <p><input type="checkbox"/> Chemistry</p> <p><input type="checkbox"/> Geology/Earth Science</p> <p><input type="checkbox"/> Physics</p> <p><input type="checkbox"/> Science Education</p> <p><input type="checkbox"/> Other</p>
<p><b>Physics</b></p> <p><input type="checkbox"/> Biology/Life Science</p> <p><input type="checkbox"/> Chemistry</p> <p><input type="checkbox"/> Geology/Earth Science</p> <p><input type="checkbox"/> Physics</p> <p><input type="checkbox"/> Science Education</p> <p><input type="checkbox"/> Other</p>	

**VIII. Degrees or certificates.** Some statistics count teaching certificates as well as degrees in defining in-field teaching. This, for example, is the major reason many states say they do not have a problem with out-of-field teaching. States tend to keep track of the certificates they issue rather than the degrees teachers hold. And, since many states still have rather slack subject-matter requirements for obtaining a teaching certificate, the problem becomes obscured. (For example, half the states consider seventh-grade math teachers to be “appropriately certified” if they hold a generic “K–8” certificate.) On the other hand, the National Commission has combined certification with major/minor to create an even more rigorous definition it calls “fully prepared.”

**KEY QUESTION:** What qualifications count for in-field teaching?

- Degrees only
- Certificates only
- Degree *plus* certificate
- Degree *or* certificate