

Research shows that just 36 percent of new science teachers are teaching only in their trained subject

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Despite efforts from No Child Left Behind to promote 'highly qualified' teaching, recent research shows that just 36 percent of new secondary science teachers are teaching only in their trained subject. Credit: Nate Edwards/BYU

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only in their trained subject.

Ryan Nixon spent four years studying matter, energy and the universe—and learning how to teach those and other physics-related concepts to teens. In his first year as an eighth-grade teacher, he hit a roadblock. He was supposed to teach his students geology: something he hadn't learned a thing about since, well, eighth grade.

"As a new teacher, you don't know what you're doing, but if you let teenagers know, that's not a good thing," he said.

Nixon, now a Brigham Young University assistant professor of [science education](#), teamed with colleagues from the University of Georgia to explore both the rates and predictors of secondary science teachers who were assigned classes out of [field](#), focusing on teachers in their first five years on the job. Among their findings: 40 percent of these new teachers taught mostly or entirely out of field, and 64 percent had at least one out of field course in their first five years.

The team focused on early career teachers, he said, because it's a group already facing myriad challenges adapting to the classroom setting: 50 percent don't make it past their fifth year. "When you're a new teacher and you want a job, you take the job the principal gives you," he said. "And if you're assigned out of field, maybe you figure it out and do a good job with it, but it makes your life hard."

Though past research has looked at various aspects of out of field [teaching](#), this is the first study that has explored secondary science out of field teaching in the No Child Left Behind (NCLB) era. In 2004 NCLB mandated that teachers be "highly qualified" in their subjects, which at first, Nixon said, essentially prohibited out of field teaching. But with a loosened definition of "highly qualified," just 36 percent of new science teachers are teaching only in their trained subject.

Those numbers, Nixon said, aren't great news for students either. "Their teachers are working really hard, but they're teaching subjects they're not really prepared to teach. And the teacher can try again next year, but if you're the kid in 11th-grade chem, you don't get to try again."

But science is science is science, right? Nope.

Each of the disciplines has its own areas of focus, structures, rules, methodologies, languages. When teachers don't know the content of a particular discipline, Nixon said, their classes become more constrained, more about rote memorization and repetition than working through ideas in depth.

"If science teaching and learning is about making sense of the world and understanding how experts in these disciplines work, then that's an issue," he said.

One particularly troubling finding in the study was that urban and rural schools and schools with high English-language-learner populations are more likely to have teachers doing out of field instruction. These schools, Nixon noted, are often already underfunded and often already have more new teachers than other schools. "It's just adding to the challenges these students are already facing to be given these teachers who aren't prepared to teach the things they're teaching."

Though the problem has its root in a number of areas, including vague policy, Nixon believes important change can come when administrators are aware of the issue.

"I wonder if administrators really realize it's a problem. 'You're a science teacher: why does it matter? Teach whatever,'" he said. "But when it comes down to it, administrators need to say, my teachers need to be where they can teach best."

More information: Ryan S. Nixon et al, Prevalence and predictors of out-of-field teaching in the first five years, *Journal of Research in Science Teaching* (2017). [DOI: 10.1002/tea.21402](https://doi.org/10.1002/tea.21402)

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