

Introduction to the cases

The case presented here is drawn from a larger national study investigating the 5-year science teacher retention rates in four U.S. states (New Jersey, North Carolina, Pennsylvania, and Wisconsin).¹ This study has two distinct phases. In the first phase, researchers used publicly available staffing data from 2007-2018 to construct a 5-year retention map for six cohorts of novice science teachers in each state. This approach differs from sample-based retention studies because full data permitted our team to map the career trajectories of each individual science teacher for a more comprehensive picture of teacher retention, mobility, and attrition. For example, in sample-based studies, the departure of a teacher at the end of one year might simply be categorized as attrition. In viewing a 6-year trajectory, we were better able to identify teachers who left a position in a given year not simply as attrited, but possibly as having transferred to a different district (mobility) or taken a year off and then returned (such as for parental leave.)

After analyzing individual teachers' career trajectories, we calculated the 5-year retention rate of newly hired science teachers in each cohort for the years 2007-2012 for each school district. This analysis informed the second phase of the research, in which five districts per state were identified for a more detailed case study on the factors influencing science teacher retention. Districts were sorted initially for higher-than-average rates of retention, and we focused on those in the top 10% in the state. We then attempted to diversify our selection of districts by looking at factors such as school size, location within each state, type of community (urban, rural, suburban,) and relative wealth of the district. We also looked for districts that had hired (and retained) teachers of color and teachers whose teacher education programs had been funded by the National Science Foundation's Noyce Teacher Scholarship Program, which was created to meet the need for well-prepared STEM teachers in the United States.

The district described here was one of those selected in the state of New Jersey, and a separate NJ state teacher policy case study covering the time period of this study is available on the project website. The district name is presented as a pseudonym for purposes of confidentiality. The names and position titles are similarly obscured in this case, and also in the larger study, in order to preserve internal confidentiality as well.

For further information about the study, please visit: <http://www.montclair.edu/IMPREST>

¹ This material is based on work supported by the National Science Foundation under Grant #1758282. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

The town of Sandstone is located in the ridge and valley section of Pennsylvania, and its origins as a population center can be traced to the anthracite coal mining industry that emerged there in the mid-1800s and peaked in the early 20th century. The town's population has fluctuated with the economic fortunes of the greater region, and its periodic need for labor has long made Sandstone a destination for immigration. The most recent demographic trend has been an increase in the population of Spanish-speaking residents from the Caribbean. Consequently, the town has been featured prominently in the national media over the past two decades as a proxy site for larger partisan and political disagreements over issues related to immigration, as well as for its status as a bellwether in presidential election years.

The Sandstone Area School District serves about 12,000 students, and took its current form in the mid-1990s, when a number of smaller school districts were consolidated. Currently, the district has one high school with three campuses, run by a central administrative team. Most students attend the main high school building, while a second nearby campus serves as a vocational center. The STEM academy campus is located a few miles outside of the city center, and serves a smaller number of students. The district also operates about a dozen middle and elementary schools as well.

The student enrollment at SAHS for the 2017-2018 school year was reported as roughly 40% Hispanic, 45% White, 2% Black, 1% Asian and 2% other. Of this population, about 13% of students receive special education services. About 70% of students attending Sandstone Area High School are classified as economically disadvantaged, and over 20% of students are classified as English Language Learners.²

The Sandstone Area School District was initially identified for its higher-than-average retention rate of novice science teachers, and what made it a site of particular interest was the large population of students categorized as English language learners.³ Between the study years of 2007 to 2017, of the five science teachers hired, all five were retained. Additionally, upon conducting our interviews, we identified several experienced teachers who were retained for 20 years or more. The research team interviewed ten individuals in Sandstone School District, including four novice science teachers, four retained science teachers, one of whom also served as the science department head, and the principal. The primary goal of the site visit was to better understand the factors that may have influenced teacher retention during the focus period of the study (2007-2018) and to also investigate current practices around the mentoring and induction of new science teachers.

Findings

As a result of this site visit and subsequent data analysis, we posit three factors that likely influenced the high science teacher retention rate observed in Sandstone School District. These are (1) a well-paying job in their community (2) the rewards of being a teacher in Sandstone, and (3) a close-knit department. This section is followed by a brief description of current mentoring and induction efforts at Sandstone School District.

² From the Pennsylvania Department of Education, Data and Reporting website:
<https://www.education.pa.gov/DataAndReporting/Enrollment/Pages/PublicSchEnrReports.aspx>
<https://ocrdata.ed.gov/search/district>

³ Within science education and other fields, the term “English Language Learner” and its variations are now being retired in favor of more asset-based terms such as “emergent bilingual” or “emergent multilingual” students (González-Howard & Suárez, 2021) The Pennsylvania Department of Education defines English Language Development (ELD) as the curriculum taught to English Learners (EL) by English as a Second Language (ESL) certified teachers (Pennsylvania Department of Education, 2021).

Factor #1: A Well-Paying Job in Their Community

A recurring theme in our discussions with teachers and administrators in Sandstone was a desire to live and work in that particular community. The science department chair, who had been a teacher in the district for many years, noted the importance of area ties to the teachers there:

Many of them [teachers] are tied to the community, many of them have been born and raised here, and you know, I don't think they would leave to go to another school that they're going to drive a half an hour every day. You know, they can stay in their hometown school.... I think you'll find when our teachers are living here in the community, and this is part of their community, I think that's a big part of sticking around.

Many of the teachers we interviewed had indeed grown up in the local community, and some had even attended Sandstone High School themselves. In an interview with two of the experienced teachers, one of them explained, "I would say, a good portion of us that right now are the older ones, that have been around, we went to school in this district, or I mean in his case he went to Catholic school, but it was still within the district boundaries." One teacher we interviewed had a parent who had also been a teacher in Sandstone. Another told us she stayed because many of her relatives lived in Sandstone, noting, "If my extended family was from an hour away, I'd probably be working an hour away."⁴

Many noted the high esteem in which the schools were held by both those who worked there as well as the community. "There's a lot of pride in our building," one teacher noted. "There's a lot of people doing really good work here. There's a lot of good teachers here." Another teacher echoed that sentiment when he said "This is *their* school and I think a lot of them are very proud people and they're proud of the work they're doing."

Yet this desire to live and work in the area was often accompanied by an admission that working for Sandstone Public Schools was a very good job in a region where such work was often hard to come by. Administrators and teachers alike noted that the pay in Sandstone compared favorably to surrounding school districts, and pointed to their salary and other material benefits as a major reason for remaining in the district.

"I don't really know how it compares to the larger cities like Philadelphia or Pittsburgh salary-wise," said one experienced teacher, "but I do know compared to the local, smaller high schools around us, we do have it better financially." A novice teacher concurred, stating, "Financially it just makes sense to stay here when you get here." The science teachers we interviewed also referenced their prospects outside of teaching as well. One teacher said, "I honestly have stayed [in Sandstone] because it's a good job and if I wanted to leave, I can't get ...paid in industry, what I'm getting paid here."

The Sandstone School District Area is quite expansive, with a populated central district and rural outlying areas; the nearest towns are a significant distance away. Therefore when teacher graduates seek work in the area, the most opportunities are in Sandstone. One science teacher we spoke with framed this as an issue of local supply and demand:

⁴ Reininger (2012) notes that "working close to where they grew up is a distinct characteristic of teachers," (p. 127), and Sandstone as a district appears to have the hallmarks of the type of district described by Reininger that benefits from such a local teacher workforce.

Well, one thing I can say is in [our part of] Pennsylvania it's tough to find teaching jobs and, this being a very large district, we need a lot of teachers. And so, I think a lot of teachers come here because, I hate to say, it's the only place they can get a job. It's maybe initially why they come here, because there's not a lot of other options, but then they stay.

One teacher contrasted her own experience with that of a recently-departed teacher who had commuted from a distant town. She described being able to meet her own young children at the bus stop because she lived so nearby. She said, "I'm home by three o'clock because I live close. There's teachers that aren't getting home until four o'clock you know we get out at the same time, that's a big difference." She added that teachers who lived outside of the community had higher commuting costs, "And gas money, it's expensive." She continued:

We're losing teachers that they're hiring that have to travel. We lose them really fast, like sometimes three or five years, a lot of times it's because they want to have a baby or whatever, but they get tired of traveling. I think that's the difference... We do have a good portion of teachers that travel half an hour or more to come to work. Some even an hour so. They're the ones we tend to lose.

An additional material affordance of working in Sandstone mentioned by teachers was the support for professional growth offered by the district. One teacher noted that Sandstone offered "a direct payment plan for Grad school. Instead of sending me a bill, it will go straight to [local college], so if I'm lucky, I won't have to pay anything for my Master's Program."

Factor #2: The Rewards of Teaching in Sandstone

It is not uncommon to hear teachers discuss the rewards of teaching, and the Sandstone teachers were certainly able to do so. Yet we could not help but note how deeply rooted these discussions were with regard to teaching in Sandstone schools specifically. A sense of both the difficulty of the teaching context, as well as teachers' self-efficacy through successfully meeting those challenges permeated our discussions

When asked why they have chosen to stay at Sandstone, many teachers told us it was because they loved to teach. One experienced teacher said, "I have a chance to make an impact on someone's life. It's rewarding I mean; I love teaching. Despite those bad days..." This led to a comparison with a previous position in a different state:

When I was in Maryland, we were in traditional scheduling 45-minute classes and we were a national and state blue ribbon school, I taught only honors biology. I don't want to say it was easy, but it was kind of easy after a little while. Then I came here to a completely different situation. And now, I kind of take a little pride, like, if I can make it here, I can do anything. You know what I mean? It's tough but it's almost like a badge of honor. Like, I can do this—you can't scare me, I've taught here.

This led to a discussion about the transition to virtual teaching during the pandemic. "I've really taken my technology skills up a notch, you know? So despite all the times you just want to cry or just give up, you know you can look back and say 'look at what we've accomplished.' I'm a teacher down to my bones." For her, teaching was a fulfilling vocation, and there was a clear

connection between the skills she possessed as a teacher and her ability to overcome challenges by deploying these skills in Sandstone.

Similarly, another retained teacher explained that for him, the rewards came specifically from teaching science to young people. He also suggested that for him and his colleagues, the desire to teach was rooted in making a difference in the lives of his Sandstone students:

I really believe we just love teaching and working with these young people, it really is an honor and it is a privilege, and the young people are fantastic. They really are. And it breaks my heart to see some of the situations they're coming from. And that maybe the parents don't appreciate them as much as they should, but young people they're just fantastic they like to learn and it's a privilege to work with them.

For another retained teacher, the teaching profession offered certain benefits she felt she may not be able to find in other careers:

I like a lot of things about it. I also enjoy teaching and meeting people and I like that it's different every day. You definitely do not get bored, it's different every year. And you know, on those occasions where a kid will tell you that you've made a difference, or something that, sometimes it's enough to get you through the hard days you know. I'm not gonna lie, I love the schedule. I love that we're done at 4:00 every day and we get the summers to recharge and not get burnt out. I couldn't teach if I had to do it year-round. It would be tough, because I feel like you need that recharge period.

It was unclear whether this passion for their career would translate if they moved to a different school or with a different body of students, though the rewards of teaching did appear linked to teachers' particular experiences in Sandstone. Many of the teachers, as well as the principal, expressed that for them teaching was more than just a career, but a way to make a difference in the lives of their students.

Throughout our interviews, teachers also referenced the negative reputation Sandstone had developed over the years, often emphasizing the changing demographics of the student population. One teacher noted, "We have a very high percentage of ESL (English as a Second Language) and ELD (English Language Development) students" and "one of the challenges is that science has its own language. So, trying to teach a low-level ESL or ELD student who doesn't know English, let alone tell them about biogeochemical cycles I mean you're already on an uphill battle." Yet, it seemed notable that the Sandstone science teachers we interviewed accepted this challenge as part of their jobs as educators, instead of pining for a different body of students.

Factor #3: A Close-Knit Science Department

Given the large size of the district, the science department was correspondingly big as well. One of the experienced teachers described their working environment in Sandstone this way:

It's a very diverse group as far as backgrounds and interests and it's also a very close group. I think our science department works well together. Overall, they're a very welcoming group and a very helpful group that works together and shares ideas. I think we have enough differences as far as teachers, you know, experienced teachers, new teachers, teachers that have been in industry and became teachers, and teachers that have gone the traditional route. I think it's a very well-rounded group. Everyone seems to find their niche and can find others that can help them. There's always someone who can answer your question or give you ideas.

When asked why they have chosen to stay, most teachers talked about how much they enjoyed working with their science department colleagues. Teachers explained that at Sandstone, they felt a sense of camaraderie with the co-workers in their department and that everyone was willing to help each other and share their materials. One retained teacher described the collaborative and supportive environment in the department:

I'm going to brag about our department, because we are pretty well intertwined and very helpful, of course, like anything you have a few rough spots, but we've all helped each other, especially going virtual. The cooperation in the department has been phenomenal. You know when somebody finds something that works for science, we share it."

Another retained teacher explained that for him the people he worked with were more than just colleagues and that is one of the reasons he has stayed for so long at Sandstone. "I tend to think that there are some actual friendships being built here, so we want to stick around where we like the people." Two of the more experienced teachers shared with us that they, "walk a lot after school or on weekends, or in the summer and I feel like a lot of those walks we're talking about you know, we should use this for this class, or if I'm doing this, what should I do." Teachers cited such departmental friendships that extended outside of the school day:

I feel like a lot of the departments in our school tend to kind of hang together. You'll see a lot of math teachers out together outside of school, as well as us, and the English tends to be tight, but I do feel like there's more science teachers. Where there might be two or three math teachers there's like more science teachers that are bound to get together or you know hang out outside of school.

Some of the teachers explained that in Sandstone their closeness developed by overcoming shared challenges. One experienced teacher explained that she knew the teacher down the hall would "have her back" if she ever needed them and another told us that in other schools they may "put you through the wringer until you figure it out." Contrasting this with her experience at Sandstone, she said:

We have a really good department that's one of the reasons why I stay. I mean I love my job and I love teaching, but through all of the challenges—with Keystone testing and the pandemic—we have such a good department we're very . . . we can depend on each other, and bitch to each other. You know, I really think that our department stands out in this school as being the most close-knit. So that's one of the things that I love about being here.

Both experienced and novice teachers alike felt that within their department they were welcomed, supported, and encouraged to work as a team. One of the novice science teachers told us she felt “That the energy is very positive, I think that you feel the support here, and I think that it is just a nice place that you want to be a part of.” One of the retained teachers stressed the ethic of working together in the department, and expressed that support for novice teachers was balanced with an expectation that they each had “something to bring to the table”:

As far as sharing materials and ideas, we have had a couple new teachers, and I think we have a good group of experienced teachers that are willing to share ideas and even learn from those who are younger. We’ve been getting a lot of great ideas, you know, obviously from those newer teachers who are fresh out of school and you know exposed to some newer ideas and technology, especially helping some of the more veteran teachers who might not be as experienced with the technology. But they really do come together, even you know, through our virtual meetings and we use Microsoft Teams. So, we have teams on there where they just can post and share ideas and comment on things, or even group texts, we have department group text where people share ideas.

When asking teachers how this closeness was fostered within the department, two of the experienced teachers told us that it was due to the support of the principal and department chair. These two administrators, one who was completing his 12th year in the district and the other their 10th, respectively, were described as fostering an environment which encouraged the science department to work together. One teacher explained:

You can have a boss who’s very supportive and if whether you get in trouble or not, whether you make a mistake or not, it is just a good feeling of confidence that he will really be there to support you and the same with our science department, they support you where that may not be the case, like there are districts or other principals, where if something was wrong, the first thing they would do is make sure that they are covered and cleared and that you would be left out high and dry.

It was evident when speaking to the teachers and the principal himself that he had a sense of gratitude and respect for his staff and wanted the best working environment for them. The principal told us:

I’m very lucky. I’m getting caring adult professionals that could probably make a lot more money in the science field. They love the students. I’m just trying to guide them. I’m not the expert teaching your course on physics. But I will tell you one thing: you’re going to get the backing you need and I’m going to do everything I can to make sure you have everything you need for your students to be successful.

Mentoring and Induction

Although there is currently no formal induction program, beyond the provision of a mentor teacher, historically in the district there was a district-wide effort to support new teachers during the time period of interest for this study. Teachers described this district wide program as mandatory for new teachers and taking place over a period of two years. New teachers would

attend monthly evening sessions that would center around particular topics, many of which were pragmatic instructions on how to do particular things in the district, and were presented by individuals related to those topics, such as a guidance counselor or union representative. One teacher explained that although she was already familiar with much of the material presented, it was good to have a “refresher.”

Although this program ended, the district still requires all teachers to receive a mentor teacher during their first year. At Sandstone, mentors have been typically selected in order to match incoming teachers with someone teaching a similar content. Although mentor teachers did not receive specific training, the principal explained “we do pick our mentor teachers, you know we don't give it to everybody. They are purposely chosen and matched up with people as best you can. So, we do try to give them the mentor who we would like them.” Additionally, a retained teacher explained that mentor teachers had to be teaching at least five years in order to receive a mentee and they administrators would try to “spread it out so that it's not the same people every year.” Individuals chosen to be a mentor are given a stipend at the end of the year paid for by the district. However, although it was considered useful by the teachers at Sandstone, one teacher expressed they “got more from” [their mentor] than I got from the induction process.”

Some retained teachers reported establishing meaningful relationships with their mentors, while others explained that the whole process was more of a formality. One teacher we interviewed said that her first year at Sandstone was very difficult, and the only reason she did not leave was due to the support she received from her mentor. “For me, I had one of the best mentors I could have had,” she said. “If wasn't for her talking to me and telling me things and trying to give this a shot, I wouldn't be entering my third year.” Another novice teacher also told us, “My mentor teacher is awesome. I talk to him and ask him questions basically every single day. I'm sure he's sick of me at this point, but always there telling me what I need to hear, or at least given me an idea of what I should do.” Other teachers explained that their mentor teachers helped them their first year, particularly in the area of classroom management, suggesting that as a teacher, you must learn to “pick your battles.”

Not everyone had a valuable experience with a mentor however. One teacher who was new to the district but not the building said that although working with a seasoned teacher was helpful, they “felt like this is a waste of my time like I could be making a test, I could be grading papers, and so I don't feel like I got as much out of it as I probably could have, but I also to be fair didn't have the best mentor. Even though she would provide me with some resources, I didn't feel as though I needed a babysitter and that's what she kind of was.”

Outside of assigned mentors, teachers at Sandstone expressed that it was the informal mentorship fostered within their close-knit science department was most helpful for their success at the school. One retained teacher said bluntly, “I think the unofficial mentoring is more beneficial.” Another teacher found that sharing classrooms provided an opening for being mentored. “I kind of adopted many people as my mentors.”

It is reasonable to describe the department itself as the most valuable source of mentoring for new teachers in Sandstone. “I consider a lot of those experienced teachers to also be mentors,” one teacher explained. “They are people that I would go to and ask for help on any situation because they've seen, just drawing on their experience.” Others in the department shared similar experiences, “adopting” multiple mentors from the department in addition to their assigned mentor. Teachers in the department expressed that ultimately most of the support they receive comes from one another, something we touched upon in an earlier section. One teacher

told us that even by coming together to share lunch they are able to “bounce things off of” one another, and “even though it might not be the topic” they are able to just ask their “day to day questions.” Other teachers in the department echoed this sentiment when they told us, it wasn’t really about their official mentor, but rather, “the reality is our department really helps each other out like if somebody's teaching something for the first time they jump in and say oh wait, I have this for you.”

Conclusion

Teachers in the district explained that there were several reasons they have chosen to remain teaching in Sandstone. Their community ties to the area were frequently mentioned, as many of them lived within the town itself and some had even grown up and attended school there. Additionally, teachers credited other reasons for staying, such as pay, benefits, personal rewards, and opportunities they received in working in a district like Sandstone. Although they acknowledged the value of relationships to assigned district mentors, most attributed the district’s record for science teacher retention to informal mentorship efforts within the science department. Many clearly stated that the reason teachers had chosen to stay was because of the relationships they had developed within their department..

References

- González-Howard, M., & Suárez, E. (2021). Retiring the term English language learners: Moving toward linguistic justice through asset-oriented framing. *Journal of Research in Science Teaching*, 58(5), 749-752.
- Pennsylvania Department of Education. (2021). *Educating English learners*. <https://www.education.pa.gov/Teachers%20-%20Administrators/Curriculum/English%20As%20A%20Second%20Language/Pages/default.aspx>
- Reininger, M. (2012). Hometown disadvantage? It depends on where you're from: Teachers' location preferences and the implications for staffing schools. *Educational Evaluation and Policy Analysis*, 34(2), 127-145. <https://doi.org/10.3102/0162373711420864>