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Measuring Mobility: A Quantitative Description of SBAE Teacher Mobility in Minnesota

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Abstract

Considerations around teacher attrition, supply and demand, and retention are incomplete without including teacher mobility. The problem, as it currently stands, finds SBAE ill-equipped, at the professional level, to support mobile teachers. Providing support, however, starts with understanding the population; in this case, mobile teachers. The purpose of our study was to quantitatively describe teacher mobility in Minnesota over the last 20 years (1999-2021). To describe SBAE teacher mobility in our state, we utilized teacher retention data compiled from state teacher directories over the last 20 years (1999-2021). We corroborated previous findings noting heightened attrition after year one in a new school, and school retention of mobile teachers to average about three years. These findings bear implications for our pre-service preparation, induction level support, and mid-career advice and support relative to the suggested reduction of frequency in mobility with additional teaching experience.

Introduction

Teacher retention has arguably been one of education's greatest issues throughout the last decade (Palma-Vasquez et al., 2022). The most recent school pulse panel reported 53% of United States schools were understaffed entering the 2022-2023 school year (IES, 2022). Instability in the teacher workforce can limit resources and divert schools' focus from educational advancements (Palma-Vasquez et al., 2022), particularly in already disadvantaged schools (Goldhaber & Theobald, 2022; Williams et al., 2021). In other words, schools are not able to advance student learning while constantly onboarding due to teacher turnover. Such challenges are further compounded as less experienced teachers tend to replace more experienced peers (Feng & Sass, 2012; Haddad et al., 2021; Ingersoll & Smith, 2003). At the school level, instability may take the form of teacher attrition, evidenced by teachers leaving the profession, or teacher mobility, manifested by teachers moving to a different school (Palma-Vasquez et al., 2022).

To alleviate issues related to teacher attrition and propose solutions for teacher retention, we must move beyond the current conversation. Current School-Based Agricultural Education (SBAE) research tends to consider the individual characteristics of those who stay, move, and

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leave (Igo & Perry, 2019; Lemons et al., 2015; Solomonson & Retallick, 2018; Solomonson et al., 2019; Solomonson et al., 2021; Solomonson et al., 2022; Sorensen et al., 2016). Within SBAE, licensed teachers made up approximately 85% of 1680 new hires nationwide in 2021 (Smith et al., 2022). While only 674 (5% of a 13,349 SBAE teaching force) left SBAE teaching, continued growth in SBAE meant vacant positions remained, even as a new school year began (Smith et al., 2022). While the national data shows one angle of the retention picture, our experience points to state-level data being more nuanced. While the data existed, we needed additional information to engage the data to elicit nuance and better support our pre-service and in-service workforce.

Beyond quantification, recent research related to SBAE turnover largely focused on teachers' career satisfaction, commitment, self-efficacy, identity, and motivation (Clemons & Lindner, 2019; Hasselquist et al., 2017; McKim & Velez, 2015; Solomonson & Retallick, 2018; Solomonson et al., 2021; Solomonson et al., 2019). While valuable for individual teachers, these studies did not speak to the impact teachers' career practice had on a broader profession. Studies in SBAE mobility focus on the teacher and the necessity of moving between schools to make a career out of teaching (Haddad et al., 2019, Haddad et al., 2021). Little currently addresses the schools in which SBAE teachers work, a gap that must be remedied, recognizing the impact of an individual within and on a system.

Even in addressing the schools in which teachers work, much of the current literature in SBAE and in education more broadly focuses on alleviating teacher attrition by applying solutions based on the previously mentioned teacher characteristics. Much of the current SBAE literature identified opportunities for professional development in content and characteristics attributed to career longevity to bolster teachers' efforts (Haddad et al., 2022). Vagi and Pivovarova (2016) corroborate this mirrors the education field at large. Specific characteristics of those who remain teaching and those who leave teaching received attention, and attempted solutions manifested based on developing specific characteristics in teachers or schools (Vagi & Pivovarova, 2016). However, Vagi and Pivovarova (2016) advocate for a more nuanced approach to issues of teacher retention. Practically speaking, we have little power to recruit based on these characteristics. Our intervention must address the systems in which teachers operate to support a more sustainable profession. We must consider teaching as a career composed of complex decisions (Vagi & Pivovarova, 2016).

Recognizing the need to consider teaching as a cyclical (Fessler & Christiansen, 1992) career comprised of complex decisions, we sought to outline the 20-year condition of the SBAE teacher workforce in Minnesota. This work began an ongoing effort to understand the workforce trends for SBAE in Minnesota to quantify the concerns we hear from teachers in our pre-service and in-service teacher support programs. Namely, moving to a new school can be as challenging as the first year teaching, less experienced teachers tend to replace more experienced ones, and joining a multi-teacher program, while becoming more common, presents new challenges. For Minnesota, 54% of beginning SBAE teachers were retained over a 20-year period, noting 88% retention rates between years one and two (Rada et al., 2021). Despite the high retention rate in SBAE, one-third of the state teaching population had changed schools at least once (Rada et al., 2021). While we can consider this a win for the broader SBAE profession, schools and communities still struggle from losing these teachers. Considering retention in terms of the teacher and the program lent well to a more complete picture of SBAE retention and gave valuable insight

into the general state of the profession. To that end, our study sought to outline Minnesota teacher mobility and the school-level attrition left in its wake.

In preparing for our study, we found ourselves asking questions related to the stability of the SBAE workforce, particularly related to experience, mobility, and retention. These questions led to the current examination of the challenging implications of teacher retention for schools with SBAE programs. To examine school-level retention of SBAE teachers, we applied a similar lens to that previously used to examine mobility (Haddad et al., 2021). Noting a focus on location, without presuming to identify individual factors, we applied Vagi & Pivovarova's (2016) call to apply person-environment theory to approach mobility (person-environment accommodation model (Holland, 1997, p. 68)). Given the limited reporting of this type of data, we began with a descriptive approach rather than a correlational one. This aligns with our data being a 20-year snapshot in a much longer history, an evolving educational landscape, and an opportunity to provide clarity for future directions for both research and practice with descriptive characteristics.

With this in mind, we sought to quantitatively describe teacher mobility in Minnesota over the last 20 years (1999-2021). We guided our research using the following questions:

1. What is the 20-year SBAE mobility rate for Minnesota? At how many years' experience do SBAE teachers in Minnesota tend to change schools?
2. How often do SBAE programs in Minnesota tend to experience teacher turnover / a change of teachers? Are they replaced with equally experienced teachers?

Literature Review

The broader educational conversation around teacher mobility finds itself squarely situated within teacher retention and attrition. By conventional terminology, our study focused on two sides of the same conversation: *lateral mobility* for teachers (retention into similar positions within the teaching profession) and *attrition* (loss of teachers) for schools (What Works Clearinghouse, 2019). The most current literature related to teacher mobility and attrition spans the career with foci across teacher preparation (Goldhaber et al., 2020), administrative climate (Perrone et al., 2019), professional characteristics (Day, 2021; Garcia et al., 2022; Gibbons et al., 2021; McKibben & Clemons, 2022; Moser & McKim, 2020; Pivovarova & Powers, 2022), teacher evaluation (James & Wyckoff, 2020), and professional development (Berezhna, 2020). Despite Vagi and Pivovarova's (2016) call, the literature focused on characteristics of teachers and schools. We argue that *lateral mobility* and *attrition* are two sides of the same coin. Our retention conversations in research and practice must bring these ideas together to better understand complex career decisions and the systemic implications of those decisions for school staffing. We will use our literature review to outline characteristics across the career span, recognizing each supports understanding how lateral mobility and attrition may be considered together.

Teachers start making decisions about their teaching career while they are still in high school as they select which pre-service program they attend. While little considers preservice implications for the path of a career, we saw implications in the literature related to subject area study and similarity of placement to initial teaching assignment as indicative of retention (Goldhaber et al., 2020). Specifically, candidates in hard-to-staff subjects (e.g., STEM-related areas) were significantly more likely to enter the teaching profession upon graduation, and teachers

who taught in schools more similar to their student teaching placement were more likely to be retained (Goldhaber et al., 2020). Pre-service programming, then, may establish systemic patterns as career outcome results were based on this early experience. While we did not explore this in the current study, we encourage others to engage with the descriptive ideas presented below with this in mind.

In considering administrative climate, Perrone et al. (2019) highlighted common phrasing still relevant in the 2023 education climate: *burnout* and *turnover*. They found administrative climate, including policies, practices, and beliefs to affect both teachers' work and their relationship quality with administration. Teachers having time for family and friends and feeling able to manage their workload significantly predicted a burnout score, and administrative climate had greater predictive power than relationships with administrators (Perrone et al., 2019). Administrative climate largely manifested as the lack of time or resources to manage an excessive workload (Perrone et al., 2019). While not specifically discussed in SBAE, the parallels are clear, and we do well to heed systemic and organizational warnings (Haddad et al., 2022). The practitioner and research conversation related to burnout pushes us to consider the interplay between teacher characteristics toward resilience as well as systems proactively reducing the need for resilience. Descriptive data cannot tell us why people move, but identifying patterns in teacher mobility and school attrition supports using patterns to answer additional questions related to teacher and program support.

Substantial attention remains with professional characteristics. Garcia et al. (2022) and Pivovarova and Powers (2022) summarized the state of the teacher workforce. Garcia et al. (2022) noted the importance of teacher voice, supportive work environments, fewer school problems, and greater teacher morale as significantly reducing attrition. On the other hand, teachers with less autonomy, alternative certification status, those teaching in charter schools, and teachers with higher educational attainment had higher attrition rates (Garcia et al., 2022). This was particularly interesting, noting the education profession tends to link educational attainment with pay increases and opportunities to move out of the classroom (i.e., into higher education or administration). Pivovarova and Powers (2022) corroborated higher attrition rates in charter schools and novice teacher populations and added nuance and validation to previous findings. Their study identified teachers as more likely to leave rural charter schools and charter schools with high free and reduced lunch (FRL) populations. Here again, we see teacher characteristics and school retention as two sides of the same coin. In identifying districts that attract and retain teachers, we may be able to establish models for success. In the same vein, our Teacher Induction Program is constantly looking for ways to develop mentor matching; identifying teachers and programs with staying power may allow new avenues of support.

Day (2021), on the other hand, emphasized the importance of commitment to a career in teaching. Day (2021) operationalized commitment to focus on passion, investment of additional time, student well-being and achievement, responsibility to maintain professional knowledge, transmission of knowledge and values, and engagement in the school community. Arguably, these are all characteristics that point to overwhelm and burnout in equally recent SBAE literature (Traini et al., 2019, Traini et al., 2021a, Traini et al., 2021b). In describing teacher mobility for the current study, we distilled commitment down to a single decision to remain in a school but offer it as a starting point rather than an end. Identifying these patterns better allows us to explore how

commitment plays into complex decisions. Furthermore, McKibben and Clemons (2022) counteracted the discussion of commitment with their approach to job satisfaction. They recognized time spent on personal recreation, salary, and working on Supervised Agricultural Experiences (SAEs) significantly predicted job satisfaction. Notably, McKibben and Clemons (2022) found SBAE teachers did not work themselves into more free time, finding years teaching and amount of time spent in recreation not significantly correlated. There will always be factors related to teacher retention outside the control of the system. Our work can support this conversation as we recognize patterns of mobility and attrition to identify where teachers are finding sustainable practice and subsequently mimicking such sustainability on a systemic level.

Moser and McKim (2020) explored teacher retention from a relational perspective. They recognized the link between career commitment and teacher connectivity and found their sample of SBAE teachers to have greater connectivity with the profession and lower connectivity to their school. Considering Perrone et al.'s (2019) findings, administrative climate may not impact SBAE teachers' career decisions in the same way. This study also bore a notable connection to teacher autonomy (Haddad et al., 2021), recognizing SBAE teachers' greater connectivity to their profession (e.g., curriculum and other teachers) was also the area where teachers worked with the most autonomy. They found teachers' school connectivity to be the strongest predictor of career commitment, but the area of least connectivity for SBAE respondents (Perrone et al., 2019). As we consider mobility for the teacher and the school, we will see school connectivity evidenced as teachers move and career commitment evidenced as teachers attrite. Knowing lateral mobility and attrition are not as simple as a single construct and connectivity is not causal, our study identifies a starting point for capitalizing on connectivity.

In addition to finding low impact on attrition from teacher evaluation, James and Wyckoff (2020) added to the conversation in considering the differential effects on student outcomes based on high and low-performing teacher exits. They suggested replacement efforts may not be as straightforward as the base number of teachers in the school or profession. In particular, they noted highly effective educators were more likely to be replaced by less effective teachers. Less effective teachers, on the other hand, were replaced by those equally effective or more effective. Notably, their study correlated experience with effectiveness, not as the sole factor, but as a necessary function of growing in teaching effectiveness. As it pertains to the imperative to understand time-in-classroom and time-in-career, we align our work with theirs. Their study suggested perhaps attrition is not inherently detrimental in all cases. This school-level assertion may also support Berezhna's (2020) recognition of mobility as a necessary quality for a modern teacher that improves the quality of educational activities in educational institutions. Embracing the idea that mobility is a necessary hallmark of the teaching career, we also situate our data as well equipped to address James and Wyckoff's (2020) concern. We were especially well situated to examine experience levels of those who move and with whom they are replaced. Understanding years of experience, both in career and in program, adds nuance to the broader retention conversation and supports understanding the systemic implications resulting from complex, individual decisions.

Theoretical Framework

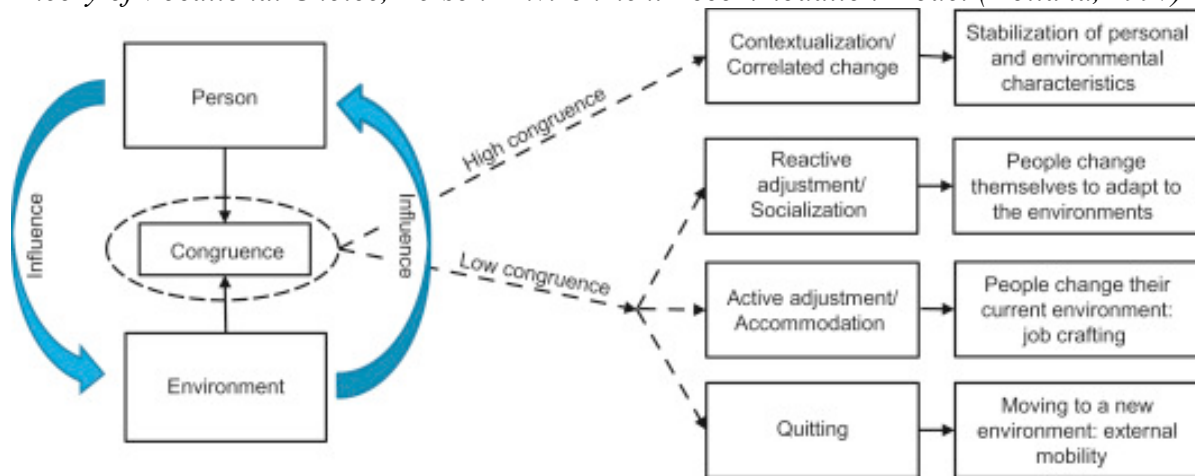
In light of the characteristics considered above, and the call to consider attrition and retention beyond characteristics of schools and teachers (Vagi & Pivovarova, 2016), we found

ourselves considering the nuance of teacher mobility as potentially productive for the individual teacher and challenging for schools and districts. Bringing ideas of lateral mobility and school-level attrition together in a descriptive analysis supported our work with teachers while identifying patterns to engage additional examination of the teaching profession. With 30% of SBAE program openings filled by mobile teachers annually (Foster et al., 2020; 2015, 2016, 2020; Smith et al., 2017, 2018, 2019, 2021) and 60% of first-time movers making subsequent program moves (Haddad et al., 2021), additional work was needed to better understand mobility on the state level. The recent teacher mobility literature noted heightened challenges for retaining early-career teachers at both the school and professional levels (Perrone et al., 2019), so this research is timely, especially in light of our professional work with early-career teachers.

Vagi and Pivovarova (2016) acknowledged the similar effects teacher mobility and attrition had on schools while also noting the differences driving teacher choice and intention. In other words, for mobile teachers, it may not be a mismatch of profession, but a mismatch of location (Vagi & Pivovarova, 2016). They identified the affordances and pitfalls of various theoretical approaches to mobility, including organizational theory, expected utility, self-efficacy, racial threat theory, and the theory of planned behavior (Vagi & Pivovarova, 2016). Studies in mobility in SBAE have applied none of these theories, instead considering mobility from a learning, career cycle, or discursive framework (Haddad et al., 2019; Haddad et al., 2021). While identifying several factors and potential theories to be applied in the teacher mobility framework, Vagi and Pivovarova (2016) argued no one theory encompassed the breadth of factors influencing a teacher’s decision to change schools. This acknowledged the teaching career as comprised of a series of complex decisions, requiring an expansive theory to encompass the multitude of factors. They suggested, instead, that person-environment theory provides the best lens for examining teacher mobility (Vagi & Pivovarova, 2016). Notably, its close counterpart, the person-environment accommodation model includes several factors of *congruence* aligning with time between program moves (Figure 1., Holland, 1997, p. 68).

Figure 1.

Theory of Vocational Choice, Person-Environment Accommodation Model (Holland, 1997)



The problem, as it currently stands, finds SBAE ill-equipped--at the professional level--to support mobile teachers. We understand relatively little about teachers’ career decision-making processes, and even less about patterns of attrition across our state or in SBAE more broadly.

Provisions of support cannot be well supplied if mobile teachers remain unidentified. Given the only study within the Journal of Agricultural Education (JAE) quantifying mobile teachers focuses on a single state (Haddad et al., 2021), it is time to add ours to the available research to better ascertain patterns of mobility for teachers and schools. This state-level data is especially important as we consider patterns that may be hidden in the SBAE teaching population are exposed in state sampling.

Purpose & Research Question

The purpose of our study was to quantitatively describe teacher mobility in Minnesota over the last 20 years (1999-2021). We guided our research using the following questions:

1. What is the 20-year SBAE mobility rate for Minnesota? At how many years' experience do SBAE teachers in Minnesota tend to change schools?
2. How often do SBAE programs in Minnesota tend to experience teacher turnover / a change of teachers? Are they replaced with equally experienced teachers?

Methods

Teacher Mobility Sample

To describe program retention in our state, we utilized teacher retention data compiled from state teacher directories over the last 20 years (1999-2021). The initial data set ($N = 1012$) showed teaching positions by school, teacher name, and teacher timeline demographics (first year teaching, first year in district, and last year in district). This position population included 771 teachers over 20 years. Using this information, we calculated years' experience at hire, time in position, years' experience in profession, mobility, and career choice. Across our state's SBAE teaching population, teachers had a mean seven years' teaching experience (median = 2, mode = 1) in a mean of 1.3 schools.

This full dataset included 186 (n_1) mobile teachers (teachers who changed schools at least once between 1999-2021) ($n_1 = 186$, 24%). We identified these teachers by initial and subsequent moves for each teacher in the full dataset and retained teachers who had changed programs at least once. We calculated the mean, median, and mode years teaching for the sample of mobile teachers ($n_1 = 186$), as well as composite mobility levels by NCES experience breakdowns. We also identified *move intervals* (time in program between moves). Teachers ranged from 0-26 years of experience in any given position and one to five program moves. Mobile teachers, collectively, held 432 positions; 246 of those comprised of non-first schools. Of these teachers, 111 were teaching in 2021, and 75 are no longer in the SBAE classroom.

Only teachers who made consecutive program moves, regardless of interval, were counted in the mobile sample. Teachers who left teaching for a time and returned were not counted in the mobile sample. Entry year did not count as a mobility year, though it could be argued the teacher was "moving" from training to workforce. Our distinction, however, is supported by substantial literature characterizing the induction year of teaching as year one. Our dataset was also limited in identifying teaching experience in other states prior to Minnesota.

School Retention Sample

We used the same initial dataset to describe SBAE program turnover in Minnesota. The initial data set ($N = 1012$) showed teaching positions by categorical variables including district name, school code, FFA region, and teacher code, and numeric variables including year started, year left, years retained, years of experience at start and end in each school, and total years of experience as of 2021. Eighteen (18) positions presented with name data only and were removed from the frame ($N_2 = 994$).

There were 250 schools comprising 994 SBAE positions (N_2) reported from 1999-2021. Position level data varied in completeness; most commonly missing position start years. This made it difficult to calculate years retained, starting experience, and total experience for the full dataset. We analyzed and reported findings based on the available data for 771 complete data points (n_2). Using the available data, we calculated mean, median, and mode for school-level retention, as well as retention by experience and composite retention by NCES experience breakdown. Given the historical nature of the data set, we noted steady school-level retention over the 20-year period. No school made up more than 1.2% of the final sample (approximately twelve SBAE positions over the 20-year frame).

Limitations

We do not purport to make comparative claims. While highlighting a historical representation of Minnesota, this should not be presumed representative of the national SBAE population. Ideally, our research will spur further examination of program and teacher demographics in other states, as we further examine these areas within Minnesota's SBAE teaching population. Data limitations also prevented the assembly of a fully historical picture. With only a 20-year frame, we did not capture the full potential of a career, and our data skew toward a less experienced workforce. Available data began in 1999, examined here as a starting point, to understand Minnesota's teaching population. These data are descriptive. We were not attempting to corroborate or dismantle themes in the literature related to school-level SBAE retention. However, recognizing to what degree Minnesota SBAE teachers are retained to programs will allow for greater understanding of broader implications for local programming and teacher careers. Identifying programs with retention challenges will also allow us to target solutions and provide support.

Findings

Research Question 1: What is the 20-year SBAE mobility rate for Minnesota? At how many years' experience do SBAE teachers in Minnesota tend to change schools?

We found 186 (24%) of the 771 teachers in this sample changed schools at least once in the 20-year sample window. This historic mobility rate corroborates the California study of SBAE teacher mobility (Haddad et al., 2021) and mirrors national data for teacher mobility for the last several years (Foster et al., 2020; 2015, 2016, 2020; Smith et al., 2017, 2018, 2019, 2021).

We identified mobile teachers as those who taught in two or more schools during their tenure in SBAE ($n_1 = 186$, 24%). These 186 teachers engaged in 246 program moves (approximately 1.3 moves per teacher). Bear in mind, teachers who moved at least once were designated *mobile teachers*. Subsequent moves were not additive in identifying the mobile subset

of teachers. Seventy-seven percent (77%) of program moves were first time moves, while only 23% were subsequent moves (two or more). On average, mobile teachers started at a new school with an average of four years of experience (range = 1-17 years) and were retained for five years, on average (range = 0-21 years).

Table 1.

Mobility frequencies by move for Minnesota SBAE teachers (1999-2021)

	Move 1	Move 2	Move 3	Move 4+
Mobility Frequency ¹	186	42	13	4
% Total ($n = 771$)	24%	5%	2%	<1%
% Mobile ($n_1 = 186$)		23%	7%	2%
Attrition Frequency ²	62	11	1	1
% Mobile Attrition ($n_3 = 75$)	82%	15%	<.01%	<.01%

Note: ¹ Mobility frequency (n_1), denotes all teachers who taught in more than one school

² Attrition frequency denotes the attrition frequency among mobile teachers ($n_1 = 186$)

In the total sample ($n = 771$), 186 (24%) teachers moved at least once, 42 (5%) moved twice, 13 (2%) moved three times, and five (<.01%) moved four or more times. No teacher made more than five program moves in the 20-year sample frame. Within the mobile group of teachers ($n_1 = 186$) there were 59 subsequent moves across 42 teachers (23% subsequent mobility rate). This is a much lower subsequent turnover rate than noted in previous studies (60%, Haddad et al., 2021). Notably, all but one of the teachers who moved three and four times were still teaching as of 2021. Even then, this one teacher was still involved in the larger profession at the time of the study (post-secondary education).

Seventy-five (40%) of the mobile teachers were no longer teaching as of 2021. Their attrition was not necessarily a direct result of mobility, noting some teachers taught upwards of twenty years in subsequent programs. On average, after a move, teachers were retained 4.8 years prior to leaving teaching (median = 3, mode = 1). The mode, is perhaps more telling than the mean, noting the most frequently attriting after a move did so after their first year in a new district (19, 25%). 111 (60%) of the mobile teachers were still teaching in 2021.

Mobility often occurs early in a teaching career. Table 2 shows years experience for mobile teachers when moving for the first five years in a new district. 47 (25%) mobile teachers had one year of teaching experience when becoming a mobile teacher. After their first five years of teaching, 125 (67%) mobile teachers made their first career move. Additionally, 74 teachers in the total population were missing beginning years, so their information is not included. Table 2 also shows the retention of teachers within their second district. 70 (30%) teachers were retained through their first year in a new district. 70 (38%) of teachers were retained in their second district one year. 161 (87%) were retained by the district between one and five years. We were missing data for an additional 25 teachers, leaving us unable to report further on district-level retention.

Table 2.

Aggregate Mobility by experience in Minnesota SBAE teachers (1999-2021, $n_1 = 186$, missing = 74)

	Experience at Hire	Retained to District
Year 1	47 (25%)	70 (38%)
Year 2	26 (14%)	36 (19%)
Year 3	23 (12%)	21 (11%)
Year 4	12 (6%)	16 (9%)
Year 5	17 (9%)	18 (10%)

Note: The mobility sample include those in their second program and beyond. No teachers in the mobile sample had only one year of experience upon starting at their second school. We had the most missing data in the start year category; all percentages above are conservative based on our total sample of mobile teachers, in light of missing data

Table 3 shows moves by years of experience by the National Center of Education Statistics (NCES) breakdown for total years of experience. 28% (53) of first moves occurred between years 4-9 in a program., with most second moves (19, 10%) occurring in this timeframe as well.

Table 3.

Mobility in Minnesota SBAE teachers (NCES experience in program, 1999-2021, $n_1 = 186$, missing = 74)

	Move 1	Move 2	Move 3	Move 4
1-3 years experience in program	34 (18%)	1 (< 1%)	1 (< 1%)	0 (< 1%)
4-9 years experience in program	53 (28%)	19 (10%)	2 (1%)	0 (< 1%)
10-19 years experience in program	38 (20%)	13 (7%)	7 (4%)	4 (2%)

Table 4 shows experience at hire for mobile teachers in Minnesota by NCES experience groupings. Notably, almost half (46%, 86) of mobility hires have three or fewer years of career experience when they make their first transition to a different SBAE program in a new school district. This corroborates trends in the broader educational research noting vacated positions are most often filled by less experienced educators. However, this may seem to contradict the data presented above. How do so many teachers make their first move at 4-9 years of experience in a program, have 1-3 years of experience at hire? This discrepancy is largely an issue of semantics. Teachers going into their fourth year of teaching have three years of experience, and mobile teachers necessarily have at least one year of experience somewhere else, hence the presentation of aggregate experience for years 1-5, and combined experience for mobile teachers and experience at hire.

Table 4.

Mobility in Minnesota SBAE teachers (NCES career experience at hire, 1999-2021, $n_1 = 186$, missing = 74)

	Move 1	Move 2	Move 3	Move 4+
Year 1-3	86 (46%)	10 (5%)	0	0
Year 4-9	29 (16%)	13 (7%)	8 (4%)	1 (< 1%)
Year 10-19	10 (5%)	9 (5%)	1 (< 1%)	3 (2%)

Note: Given the relative experience of the sample, few teachers had more than 20 years of experience and none have experienced program moves beyond 19 years. Sixteen additional data points did not include enough information to identify teacher years of experience

In addition, teachers were retained 4.8 years in a new program. Teachers changing schools started in new schools with 4.3 years' experience (on average). The mobile sample of teachers ($n_1 = 186$) had 8.6 years of career teaching experience. Table 5 outlines programmatic moves by years in program.

Table 5.

Mobility in Minnesota SBAE teachers (program retention, 1999-2021, $n = 186$. Missing = 74)

	Move 1	Move 2	Move 3	Move 4+
1-3 years in program	89 (48%)	26 (14%)	9 (5%)	3 (2%)
4-9 years in program	65 (35%)	13 (7%)	2 (1%)	2 (1%)
10-19 years in program	26 (14%)	2 (1%)	1	0

Of the total 771 (n) teachers in our dataset, 186 (n_1) were considered *mobile* (i.e., changed schools at least once). Of these mobile teachers, 48% made their first move between their first- and third year in a program, a lower percentage than found by Haddad et al. (2021). This finding bears implications for our professional induction of early-career teachers, especially considering the narrative around mobility being a career restart.

Research Question 2: How often do SBAE programs in Minnesota tend to experience teacher turnover / a change of teachers? Are they replaced with equally experienced teachers?

Across this dataset, positions in Minnesota schools ($n_2 = 771$) retained SBAE teachers an average of seven years (median, 2 years). On average, schools in Minnesota hired teachers with 1.5 years' experience. While mobile SBAE teachers in Minnesota had, on average, 8.6 years' career experience; non-mobile teachers averaged 5.7 years career experience. This difference is not causal; mobile teachers are not necessarily more experienced than their non-mobile counterparts, particularly since the school sample includes much higher instances of attrition. The full sample also included induction-year teachers who have not had opportunities for mobility. Notably, 72% of the positions over 20 years were occupied by teachers with five or fewer years of experience. Given our focus on schools, 11 schools had ten or more teachers over the 20-year frame. While many of these schools were multi-teacher programs with three or more teachers; some were not. In addition, 27 schools (including the previous 11) had eight or more teachers over 20 years. In single teacher programs, this averaged a new teacher every three years. Additional

attention in future research may look at how to best support schools hiring a new SBAE teachers at that frequency.

Complete data for 771 positions (n_2) allowed us to examine school-level turnover. Over the 20-year frame, 34% (260) of SBAE positions retained a teacher for only one year. Fifty percent (380) of positions retained teachers for two years or fewer. 459 positions (60%) maintained a teacher for three years or less. Table 6 outlines the retention rates for SBAE in Minnesota by years of experience.

Table 6.

Retention in Minnesota SBAE programs (NCES Groupings for years of experience, 1999-2021)
($N_2 = 767$)

	Frequency	Percent
1-3 years in program	463	60.1%
4-9 years in program	208	27.0%
10-19 years in program	82	10.6%
20+ years in program	14	2.3%

Only 14 SBAE programs in 20 years retained a teacher for 20 or more years, what most would consider an entire *career*. However, years retained only tells part of the story as districts must hire a teacher to replace the one who left. Of the 771 (n_2) positions with complete data, 482 (62.2%) were filled by first-time hires in Minnesota. This did not necessarily mean they were first-year or first-career teachers, but by and large, they were. Most districts hired a teacher with no prior teaching experience (410, 60%). Less than 10% of districts hired a teacher with more than five years of experience while 20% of districts hired teachers with 1-4 years of experience.

Only 3% of schools hired teachers beyond two moves. These data do not clearly tell us if schools were wary of hiring teachers who moved multiple times or if teachers left the profession after moving. However, previous studies (Haddad et al., 2019; Haddad et al., 2021) indicate both. These additional data help us understand how to better support SBAE programs in onboarding new teachers while also supporting mobile teachers.

Recommendations & Conclusions

These findings add to a growing base of research surrounding the support of mobile SBAE teachers. While we only provided a quantitative description of mobility in our state, we clarified the picture regarding *churn*, mobility rates, and the teaching experience of mobile teachers. These made a salient starting point as we contended lateral mobility and attrition must be considered together to better understand systemic implications related to school staffing. These findings bear implications for our pre-service preparation, induction level and early-career support, and mid-career advice and support relative to the suggested reduction in frequency of mobility with additional teaching experience. Certainly, SBAE teachers move, but individual teachers did not appear to be stuck in cycles of mobility asking us to reconsider previous conceptions of the *migrating teacher*.

A previous study showed 30% of SBAE teachers left teaching altogether after a program move (Haddad et al., 2021). Our sample presented a much higher frequency (62, 82%). This may have been a result of a smaller sample size and incomplete data. It did, however, corroborate Haddad et al.'s 2021 study in recognizing mobile teachers were most likely to exit the profession after their first move (compared to subsequent ones). This should warrant heightened attention for state-level teacher support programs; the first year in a new school brings heightened challenge, even for the experience teacher (Haddad et al., 2019).

We also saw mobility rates continued to decline as teaching experience accrued. While this meant several were retained to the profession through mobility, ideas of *congruence* (Holland, 1997) bear implications relative to this study for pre-service preparation, induction level support, and mid-career advice and support. In prior studies, mobile teachers have urged their peers considering a move to evaluate the desired change and if a geographical shift would affect that change (Haddad et al., 2019). For pre-service programs, raising awareness for the influence of a person on their environment and environment on a person could prove essential. The in-service patterns highlighted in this study recognize potential normalcy for non-linear career trajectories. Coupling this data with related work on teacher characteristics, such as autonomy, may support further systemic implications based on closer examination of complex career decisions.

Habits of self-evaluation follow pre-service teachers into induction where *high congruence factors* (Holland, 1997) such as contextualization and stabilization aid in seeing greater influence over environment or vice versa. We see this as particularly relevant to turnover following the first year after a move to a new program. Understanding induction as a process extending beyond the first year in the classroom should prompt teacher support programs to incorporate mobility as an essential component of the career. Providing mentoring support to evaluate career decisions may become a critical goal of induction programs, recognizing a *second induction* upon changing schools.

While *congruence factors* helped us conceptualize the necessary components for consideration between person and environment allowing us to explore mobility, we are left with questions this framework may not be well suited to answer. Only 14 (2.3%) SBAE positions over the 20 years retained a teacher for what most would consider their *career*. While retaining teachers beyond 20 years may feel ideal, this does not align with the reality presented here or in previous studies (Haddad et al., 2019; Haddad et al., 2021). This begs the question: what is a reasonable amount of time to retain a SBAE teacher? At what point should teachers change positions to better their careers? How can schools better support and respond to mobility, particularly among first-time movers? How does the three-year school-level retention rate reflected in this study affect students' SBAE experience? What incentives and policies at the district, state, and federal levels would need to be in place to make teaching careers more attractive and feasible, especially when attempting to mitigate the loss of an experienced teacher? SBAE teachers have expressed pay increases as secondary considerations in their decision-making process (Haddad et al., 2019), but they do not seem to be deterred from moving by a pay decrease either. These congruence factors remind us that "systemic implications" are not merely ideas and ideals, but are tactile, tangible components of making a career out of teaching as well.

Finally, we acknowledge the teaching career as cyclic (Fessler & Christiansen, 1992). Given mobile teachers most frequently left their teaching positions after one year in a new program begs us to revisit the anecdotal *restart* of a move in future research. This may shift our view of what it means to support mid-career teachers, particularly as they experience *reinductions* through program moves. Since we did not examine perceptions of congruence specifically, additional research is necessary to examine congruence as teachers progress through a career, and the work presented here supports which teachers and programs to ask. We can certainly point back to Vagi and Pivovarova's (2016) reminder that the driving mechanisms and subsequent supports look different for mobility compared to attrition. However, we cannot assume a career point at which stabilization has been reached, requiring no further support.

The questions driving this examination considered whether Minnesota's SBAE retention mirrored national retention challenges faced by schools, whether experience is equally replaced, and Minnesota's school-level retention rate. We found 27 schools having employed eight or more teachers over the last 20 years. While this only accounts for 11% of programs (249) in Minnesota, next steps may look to specifically support these programs in maintaining qualified teachers. While Minnesota has a teacher induction program to support first-year teachers and state staff well equipped to support districts in the *logistics* of onboarding (e.g., Perkins funding, program approval, FFA rosters), little provides direct support to districts by way of understanding onboarding, supporting, and retaining SBAE teachers. Given recent attention to teacher satisfaction, identity, and motivation (Clemons & Lindner, 2019; Hasselquist et al., 2017; Solomonson & Retallick, 2018; Solomonson et al., 2019; Solomonson et al., 2021) in the current literature, this may be warranted. In returning to the framing of this study, additional attention to congruence factors (Holland, 1997), may be a helpful starting point in supporting these identified districts in influencing retention in their SBAE programs.

In identifying implications for schools, we returned to our schools that individually represented 1% of the sample (i.e., had 11 or more teachers in the 20-year frame). Recall that the teachers may or may not have been mobile, so implications related to school-level churn and teacher mobility may not be correlated. Having state staff on our study team, we were able to readily identify contextual factors of high-hire schools. Our state staff member labeled two schools as "high churn," four as "not high churn but lots of change," and elaborated one that seemed "especially stable."

For the school that seemed especially stable, we saw an example of how program growth, not currently tracked in our data, entered the discussion on teacher turnover. While this is one example in 250 schools, it bears explicating as a point of interest for future studies and continued conscientiousness in compiling state-level turnover data. Currently, this school hosts four teachers who average 15 years' experience. While, for two of the teachers, this was their second school, a notable variable not well captured in our dataset emerged: the influence of a long-term teacher. We also noted the two teachers for whom it was their second school had substantial experience prior to moving. Since these teachers moved within their FFA region, they understood the logistics and norms at the region level. Since they had been working as teachers, they likely recognized much of what they would need to navigate at a new school. While we did not discuss this with these teachers, from a support team perspective, we heard from them less than early career new teachers. This has implications for how churn may be felt at the district, region, and state level.

While churn induces personal challenges (Haddad et al., 2019), experience likely mitigates challenge at the district, region, and state levels. This component of mobility has not been well documented and should be further explored.

Conversely, the distinction of “high churn” as opposed to “not high churn, but lots of change,” indicated a currently unexplored, but interesting perception related to program structure. First, it bears noting that retention, mobility, and turnover are not perceived as binaries (i.e., teachers do or do not, programs are or are not), even if labeled so in the data. While the numbers point to patterns, additional contextual factors must be explored to better ascertain how programs can support teaching as a profession. Second, there is something in between “stable” and “high churn” that will likely be very telling relative to necessary supports to navigate the challenges of the teaching profession. In the four schools designated “not high churn, but lots of change,” there was relatively less accrued experience compared to “stable” programs and relatively more consistency due to multiple teachers as compared to the “high churn” programs. This nuance warrants additional exploration.

While each of the 1% schools had 11 teachers over the data set, one had a teacher who remained in that program across all 10 other teachers. From the perspective of the state staff who coordinates the induction program, they noted this felt much less “churny.” Single-person programs take much more state staff and induction program support and attention in Minnesota because the total program staff turnover leaves no one local to answer AFNR questions. Conversely, despite more turnover, multi-person programs with a long-term teacher have a consistent support mechanism to alleviate challenges related to newness to both district and profession. This bears additional implications for the needs of single, compared to multi-teacher programs, relative to the support needed in professional entry and exit. As expansion continues in Minnesota, support for programs growing from single-teacher to multi-teacher programs may also be needed for the experienced and new teachers.

Given the study team’s connection to teachers in Minnesota, we also heard concerns from teachers as they navigated turnover. Returning to Pivovarova and Powers (2022) work reminds us additional work is needed to align teacher and district characteristics. Across our state, we had teachers with long careers in one district. In recent years, these programs have been adding second and third positions, warranting needed support for navigating the transition from a long-time single-person program to a new model of practice. One recommendation from teachers included having a teacher retreat for hosting guided conversations to calibrate expectations and set a shared vision for how the program will move forward. Especially salient to the recommendations for this study is the acknowledgment these programs see more turnover in second and third positions, especially in the early years of program expansion. Recognizing both the relative newness to the profession of potential recruits and heightened load of navigating a long-standing individual’s approaches to their teaching and program, challenging perceptions come into play that likely need further exploration.

Turnover in multi-teacher programs lends additional implications for future research relative to the challenge of navigating someone else’s practice in addition to one’s own in a new space. Our attempts at supporting such navigation through our teacher induction program have shown particular value for regional mentors compared to school ones. In multi-teacher situations,

the mentor from outside the district engages a different level of support, recognizing that often the new teacher needs support in navigating the relationship with the veteran. This extends the “fit” conversation beyond fit with a school or district to fit with teaching partners.

This study provided a steppingstone from which to continue exploring school-level retention challenges. We know the system of SBAE is comprised of several levels of support. Across the career, these include preservice educators, state staff, local administration, community alumni chapters and advisory boards, and educational policymakers. Each have a role to play in understanding and incentivizing factors on congruence (Holland, 1997 in Vagi & Pivovarova, 2016) to help teachers find environmental fit. Additionally, turnover in the broader workforce reminds of the need to attract the teacher first, regardless of how teachers reflect on incentives influencing their choice to change schools (Haddad et al., 2019). Further conversation with state licensing boards, school districts, and educational policymakers is necessary to consider how experience is valued when moving into teaching from industry or moving to another district. Are there behaviors, characteristics, and values the teaching profession demands that no longer align with today’s teacher? While our data do not support answering these questions, they remain, nonetheless. Regardless of the ideal retention span, we must adopt heightened attention to the dynamic interplay between person and environment.

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