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RESEARCH PRACTICE PARTNERSHIP: TEACHER TURNOVER PATTERNS IN THE STATE OF NEBRASKA

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RESEARCH PRACTICE PARTNERSHIP:

TEACHER TURNOVER PATTERNS IN THE STATE OF NEBRASKA

By
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A DISSERTATION

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Abstract

RESEARCH PRACTICE PARTNERSHIP:

TEACHER TURNOVER PATTERNS IN THE STATE OF NEBRASKA

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University of Nebraska, 2023

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The purpose of this research is to showcase the process of a local Research-Practice Partnership (RPP) with possible policy implications by analyzing teacher attrition patterns over many years. The RPP is a collaboration between a principal, the practitioner, and statistic students, the researchers. All groups were graduate-level students at the University of Nebraska-Omaha. This collaboration is part of the Nebraska Education Policy Research Lab (NEPRL). NEPRL is a collaboration between the Nebraska Department of Education (NDE) and researchers at the University of Nebraska. It was established as a learning lab to conduct rigorous research for the purpose of developing a body of evidence-based policy solutions that can be shared and applied widely within the Nebraska education system.

To guide the research, a variation of the Plan, Do, Share Conceptual Framework was used to emphasize the need for expertise, trust, and adjustments throughout the RPP. The research was conducted using staff and student data provided by the Nebraska Department of Education, containing data from the years 1982 to 2021. The researchers explore various methodical calculations to make sense of the data, including a Survival Analysis Model. This research details the process of the Research-Practice Partnership and how expertise and trust were used and developed between the partners to make adjustments to gain useful results.

The results found that teachers in Nebraska have higher attrition rates in the early and later years of their careers. Additionally, it was found that female teachers had a higher probability of leaving their role than males. White teachers were mostly to stay in their role compared to other ethnicities. Additional results also found that teachers' average years of experience has been decreasing year to year.

This research established that a Research-Practice Partnership is a reliable means to conduct a data analysis based on the Plan, Do, Share Framework. With further collaboration with NEPRL, this research should be expanded upon to gain further understanding of teacher attrition patterns in Nebraska.

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Chapter 1

Introduction

The connection between PK-12 Education and Higher Education systems continues to grow. Most simply, the PK-12 system educates PK-12 students and higher education prepares teachers for the PK-12 system. Most recently, the relationship between these two systems is ideally described as a Research Practice Partnership (RPP). RPPs exist between researchers (ie higher education) and practitioners (ie PK-12 education) to investigate problems of practice and solutions for educational improvement (Coburn, Penuel, & Geil, 2013). A RPP leverages the research expertise in the higher education setting and the wisdom of current educator practitioners. This dissertation study will describe a developing Nebraska RPP and share the formative results from the collaborative investigation on a current problem of practice: teacher shortage.

Why a Research-Practice Partnership?

Research is a driver for much of the decision making in education. The U.S. Department of Education makes research available as it is completed, and this can be found in places such as the Electronic Resources Information Center (ERIC). ERIC is a free database designed to share information on a national level to anyone seeking it (Institute of Education Sciences, n.d.). Besides the creation of ERIC, another milestone for educational research was in 2002 when the US Department of Education also released the What Works Clearinghouse website designed for practitioners to learn more about research-based practices in the classroom (Institute of Education Sciences, n.d.). Research can and will continue to have lasting impacts on education.

One important way that research impacts education is through policy. Recently, there are many examples of this as it relates to recruiting and retaining teachers.

Federally, the government has used research on teacher attrition to create funding to invest in teacher salaries (US Department of Education, 2022). Through research, it has also been determined that there are concerns with the pipeline of teachers and the barriers that exist to becoming certified. Many states are passing legislation to make it more accessible to become a teacher in their states (Mahoney, 2023; Kini, 2022). On a more local level, districts are taking what they know about teacher recruitment and creating local policies to attract new teachers (Grell, 2022). Understanding the problem is essential to formulating reliable solutions.

It is necessary to continue to provide high-quality research to policy makers so that they can make informed decisions. Since research is so critical to the educational landscape, it is critical to strive for the best methods to conduct research. The current reality is insufficient. Research in education has a disconnect between the researchers and the individuals using it: practitioners, school boards, state and national policy makers. The disconnect may arise in part from the fact that the practitioners are not the ones conducting the research and the researchers do not have sufficient practical knowledge of education to conduct reliable research in these areas. Coburn, Penuel, & Geil (2013) wrote:

> "Educators...may not have the skills or the time to produce, gather, and apply research to meet their improvement goals. The available research may not be useful or credible because researchers are not always focused on answering questions relevant to school districts' most pressing needs. And, too often, research findings aren't accessible to educators or arrive too late to make a difference." (p. 1)

Kennedy (1997) also shares factors leading to a disconnect between research and practice in education that include low quality research, irrelevant research, and research ideas inaccessible to practitioners.

Due to these obstacles, the trend of RPPs is gaining traction (Alazmi & Alazmi, 2022). Research-Practice Partnerships (RPPs) are long-term collaborations between practitioners (teachers, administrators, school personnel) and researchers (higher education) that are organized to investigate problems of practice and solutions for improving schools and school districts. The advantages to RPPs are numerous including that the results will be solution-focused for educators and policy makers, the findings will be useful for practitioners, and the results are credible because of the diverse stakeholders involved (Coburn & Penuel, 2016).

Research is often conducted by individuals who are not living in the day-to-day dynamics of PK-12 education. This leaves room for errors or missed opportunities in a variety of ways. The practitioners know the language, background knowledge, and impact of what is going into the research. The strongest research is going to have the views and inputs of those practitioners weaved into the research. This is why RPPs could be impactful to the educational research process.

Statement of the Problem

Research drives changes in educational policy. Whether the research helps find the problem, find the solution, or both, having high-quality research provides policy

makers with the proper knowledge to steer education reform to positive outcomes. Research has driven sweeping changes in education over the years and it will continue to do so. However, the current reality is that that there is a disconnect between practitioners, policy makers, and researchers (Coburn, Penuel, & Geil, 2013). There are two layers to this. First the connections between the researchers and the practitioners. "Research is not always a concept that practitioners, managers and policy makers respect. Too often it is seen as an academic activity conducted by others –to the profession, not with the profession" (Pramodini, 2022, p. 257). There needs to be a level of trust within the research that can only come with the researcher showing or developing an expertise in the area of research. Then, the other layer is connecting that research to policymakers so that it can be useful. The research and decision-making process needs to be re-examined so that research can continue to help improve education as an entire system. Research-Practice Partnerships (RPPs) are the vehicle for improving educational research, and thus, educational decision making and reform.

Purpose of Study

To demonstrate the usefulness of RPPs, this study showcases the process of a local Research-Practice Partnership with possible policy implications by analyzing teacher attrition patterns over many years.

Research Questions

Specifically, this study is motivated by two central questions:

1. What are the mobility and attrition trends of certificated Nebraska public school employees from 1982 to 2021?

2. Do these trends vary by role and demographics?

Delimitations

The data was limited to certificated public school employees in settings of grades kindergarten through grade 12. The data was collapsed into categories which could be represented in the different role titles available from 1982 to 2021.

Limitations

The showcased RPP is part of a larger, developing RPP between the University and the Nebraska Department of Education. As such, there are many examples of opportunities to continue to refine and grow the larger RPP approach, framework, and workflows.

Collaborative Research

In essence, RPP is a version of collaborative research. Literature regarding the dynamics of collaborative research is presented next so that the reader has this additional context before digesting the leading RPP frameworks.

To have the results be high-quality research, it was necessary to have multiple researchers involved in this project. Having multiple researchers involved in one project is often called Collaborative Research, with Research-Practice Partnership falling under that Collaborative Research umbrella. Collaborative research is the merging of researchers from different fields or areas on a project with overlapping interests. There are different variations and formats of a collaborative research team (Bukvova, 2010). This term has been used to describe research done by multiple people in the same research department where a group of co-workers work on a project together and all are credited with contribution. It has been used to describe research between different institutions within the same field or it could be researchers from the same institution but

different fields. It could also be as broad as utilizing stakeholders from academia and practitioners, sometimes called Stakeholder Networks or, in this case, a Research-Practice Partnership.

Collaboration Research can take on many meanings and can look very different in various settings. This research utilized collaboration between two departments within the same institution. It connected the Department of Educational Leadership with the Department of Mathematics and Statistics, both of the University of Nebraska at Omaha. In this case, the member of the Department of Educational Leadership was also a practicing Principal during the research process. The member of the Statistics Department was a researcher working on a Graduate-level Thesis. The two members of this partnership explored the State of Nebraska's Department of Education data, which required a deep understanding of statistics from the statistician, including how to cleanse, manipulate, analyze, and interpret those statistics to uncover patterns. However, it also required knowledge of the data set and an understanding of what the data represented, which came from the principal.

The idea of collaborating across disciplines or across institutions is something that has become increasingly more popular and, due to the advances in technology, this process of conducting research has become more achievable (Cummings, J. & Kiesler, S., 2005). This can be attributed to the ability to communicate via technology with tools such as data applications, collaborative documents, and video conferencing.

Bukvova (2010) came up with an extensive list of advantages and disadvantages of collaborative research. Access to expertise and resources that allows for an exchange and pooling of ideas is seen as one of the top reasons to use collaborative research. As

Katz and Martin (1995) wrote, "Often, no single individual will possess all of the knowledge, skills, and techniques required" (p. 14). Using the experiences and knowledge of multiple professionals can provide higher quality results along with more respect for the final product.

Additionally, collaborative research also reduces the risks of error and increases accuracy by including expertise in multiple areas and by just simply having more eyes on the content (Beaver, 2001). Having a group working on the same project provides opportunities for cross-checking and internal review before final submission (Katz and Martin, 1995).

Another advantage of collaborative research, and one that this project benefitted from, is that it allows contributors to broaden their understanding of their own discipline and another. Collaboration broadens one's understanding by bringing in new language and literacy that they otherwise would not be exposed to. It also allows researchers to experience one another's way of approaching research. Thus, providing new knowledge that can be retained and applied in further projects or research. In turn, creating a more "holistic, sustainable, and socially robust learning in research and higher education" (Christensen et al., 2021, p. 18).

Although there are many advantages to collaborative research, there are some disadvantages that should be considered. One of the most common is communication. Bo Lyng, H. & Brun, E., (2020) explain the barriers in communication when using collaborative research. "The objective for successful communication is the development of shared understanding. Shared understanding does not only depend on the actors' own understanding of the meaning, but additionally that the actors understand how knowledge

is interpreted by other actors in the team" (pp. 8-9). Creating a shared terminology is critical in the process. It must be considered that the contributors are coming into the collaboration with their own backgrounds, knowledge, and understanding of not only their respective disciplines but of the other disciplines, as well. This requires a common lexicon to communicate, share, and explore topics. As the research is conducted and new findings emerge, there is also a need to continue to have a shared understanding and shared meaning of the new information at hand. It is necessary for not only knowledge transfer between the collaborating parties, but also knowledge management throughout the process.

Collaborative research can also take more time and effort in the initial phases and after the research has been completed than a solo endeavor. Many of the limitations cited by Bukvova (2010) occur in the preparation phases and summary phases of the research: coordination, preparation, communication, familiarity of the team members, and setting boundaries. It takes time to discuss, identify, clarify, and reach common problem definitions; make explicit the assumed and expected performances; deal with new and unfamiliar research literature and develop and integrate friendship and collegiality (Christensen et al, 2021). It also can take considerable time in the results phase to determine what the findings are saying, their significance, and how to summarize the results (Katz and Martin, 1995). Often, it is determined that the time taken upfront and throughout the writing of the results is worth the time saved through the efficiency of each collaborator completing their own portion of the research, data collection, and synthesis of results.

To mitigate these challenges, it is important that the team consider steps to ensure smooth, effective collaboration. First, researchers should determine the stakeholders that will be interested or impacted by the research and clarify roles and responsibilities (Bansal et al., 2019). Establishing the audience and who has which roles gives clarity for the next steps within the research process. Next, each researcher needs to learn the language and terminology of the other disciplines involved. Having a common language will enhance and increase the efficiency of the results writing process. Researchers need to address differences in planning and operationalizing the study. Additionally, it is essential to discuss time management, plan frequent meetings, and create systems for open communication (Lustig et al., 2015).

Collaborative research has unlimited potential. More and more research articles being published are done with credit going to multiple authors. Not only is this process being used to conduct written research, but many physical products are being created, as well. These projects have ranged from "an algorithm for large-scale predictive species distribution to a blood-flow simulation for prosthetic heart valves, [and] a system to support manual manipulation of virtual objects..." (Cummings, J. & Keisler, S., 2005, p. 708).

As Christensen et al. (2021) writes, collaborative research "may create a new framework for innovative learning through collaboration, not the least of which achieved in the process of sharing one's unique personal experiences, professional knowledge, and frames of reference...[it] is an important factor to tackle complex future educational challenges to build socially robust and transferable knowledge to both scientific and

societal practices" (p.5). The collaboration used in this research provided experiences for the researchers but also helped create robust, useful results for its stakeholders.

Designing RPP Frameworks

There is no single framework widely used across RPPs. All frameworks presented in this section have elements of collaborative research embedded within them. This section provides highlights of commonly referenced RPP frameworks. The reader is invited to keep the dynamics of collaborative research in mind while reviewing the following frameworks.

Brighouse et al. (2016) developed a framework for educational decision making to be considered by researchers and policy makers. The steps are to identify pertinent values, identify key decisions pertinent to those values, use evidence to evaluate options, and then decide based on values and evidence. The third step, using evidence to evaluate options, emphasizes the importance of research in the decision-making process. They write that educational policy makers "must be attuned to the challenges of measurement and able to make effective use of social science research" (p. 22). It is undeniable that research is interwoven into education and necessary to create positive change in education.

Alazmi and Alazmi (2022) proposed a Research, Policy, and Practice Framework (Figure 1). In Stage 2 of their six-stage framework, they emphasize problem identification. Within that stage they state that to properly identify the problem, high quality research must be considered. They focused on four factors of research that were necessary to consider it high quality: 1) research must be relevant and address a problem,

2) it builds upon good methodology, 3) it is reliable and valid, and 4) it uses cooperative work between multiple researchers (Figure 2).

Figure 1

Research, Policy, and Practice Framework
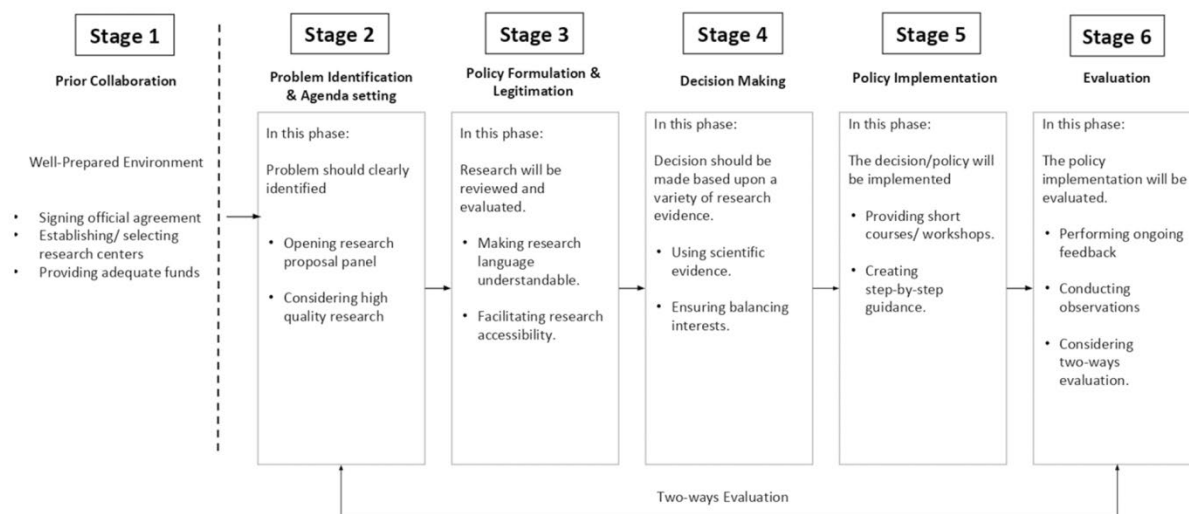
(Alazmi & Alazmi, 2022)

Figure 2

Factors of High-Quality Research
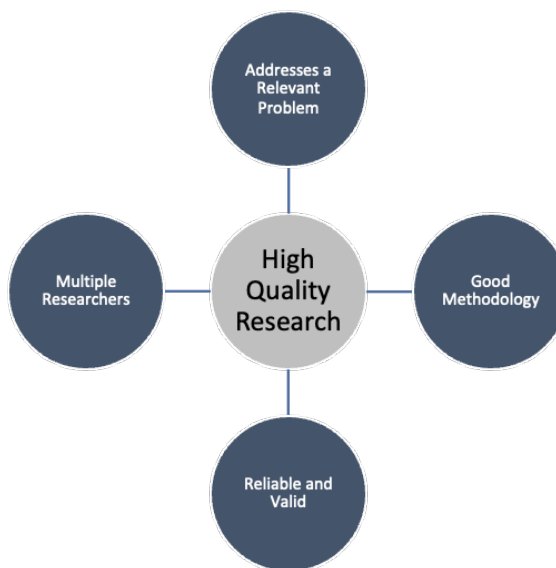
Based on framework by Almazi and Almazi (2022)

Research-Practice Partnerships (RPPs) are a reliable method to create high-quality research using the requirements from the work of Almazi and Almazi (2022). First, they require addressing a relevant problem. RPPs have a high probability of addressing relevant problems because of the involvement of practitioners. It should be safe to assume that if a practitioner is going to dedicate time and resources to this research, it is for a cause relevant to their endeavor as an educator. Almazi and Almazi's framework also requires good methodology which ensures the results to be reliable and valid. The researcher in the RPP will ensure that the methodology being used is good. The researcher will have the knowledge to know what type of data to collect and how. The researcher will provide expertise on the type of empirical study that will take place, whether the data should be collected from a survey, observation, or an already existing data set, among others. In addition, the researcher will also ensure that the design of the study results in valid and reliable data. The practitioner will make sure the research is relevant while the researcher will make sure the chosen method results in reliable and valid data.

Ishimaru et al (2022) describe a horizontal and vertical matching of partnerships in RPP. Vertical partnerships connect PK-12 classroom educators (closest action in practice) with district office administrators (system decision makers) and higher education faculty (research design experts). Horizontal partnerships connect district office administrators (systems decision makers) with other content-area district office administrators (peer systems decision makers) and higher education faculty to resource any research study questions. Vertical and horizontal RPPs create shared inquires aimed

to bridge individual educator and classroom-level practice with ongoing district-level capacity building and coordination across the system.

The specific design of a RPP depends on interpersonal and structural strengths of all stakeholders in the partnership. Farrell et al (2022) propose the following framework to structure and judge the success of a RPP (Figure 3).

Figure 3

Learning at the Boundaries of Research and Practice
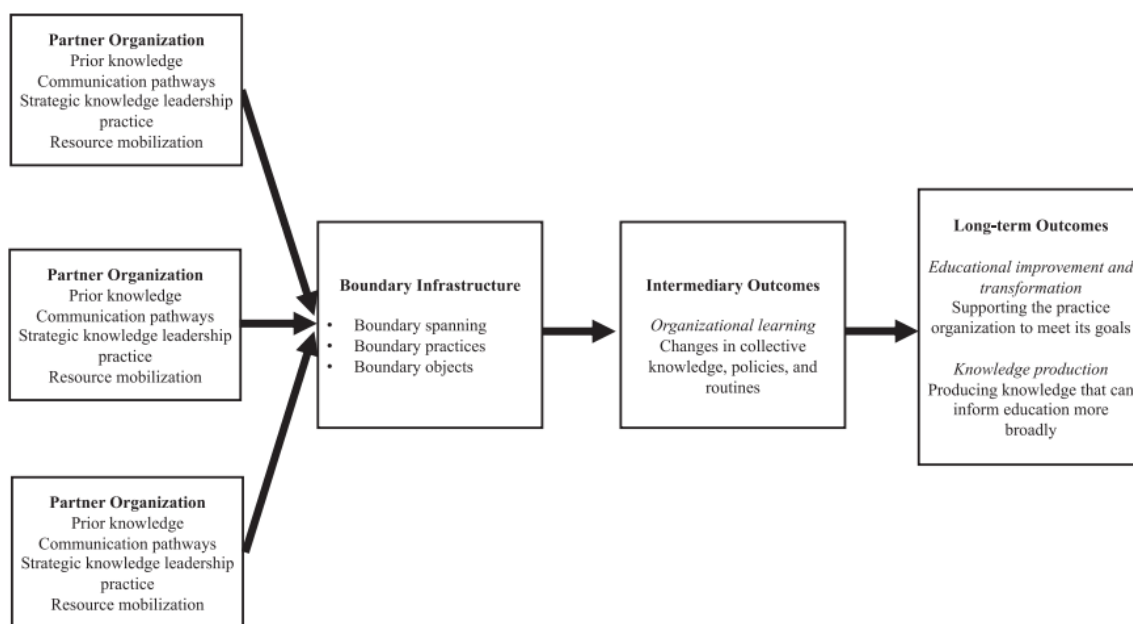
(Farrell et al., 2022)

Farrell's framework emphasizes the value of RPPs is to positively impact collective knowledge, policies, and routines for all stakeholders. Additionally, the long-term outcomes must include educational improvement and transformation. Using this language, the reader might consider the overlap of RPPs and the purpose of any continuous improvement process.

A final framework to share with the reader is the Prepare, Do, Share Conceptual Framework (Figure 4) explained in Williams et al. (2020). This framework centers the bulk of work in the Goal Free stance (Mertens & Wilson, 2019) during the Prepare phase. Instead of clear targets, there are many opportunities to make unexpected observations which lead to new, unknown targets and investigations within the data. This is not a true exploratory data approach, but instead, the invitation to set aside personal agendas and let the data relationships initiate further conversation and exploration.

Figure 4

Prepare, Do, Share Conceptual Framework
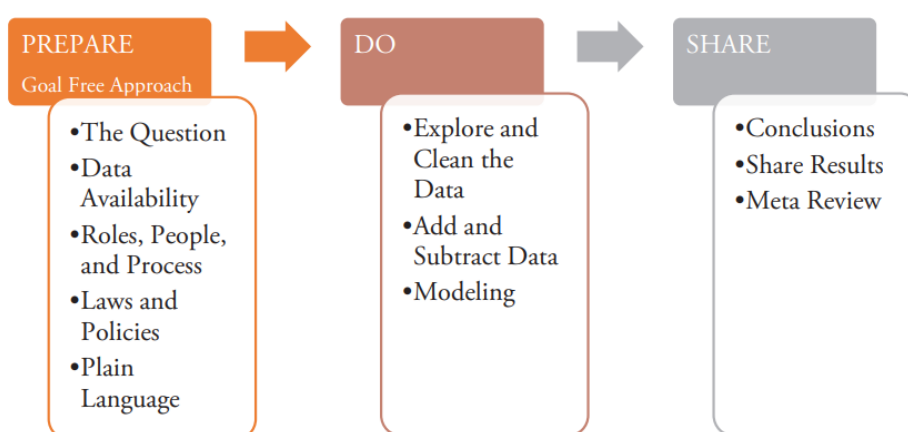
(Williams et al., 2020)

Showcase RPP Conceptual Framework

As evidenced in the previous literature, there is no singular strategy for RPPs. For this showcased RPP, the researcher has chosen to overlay three essential components of successful RPPs: expertise by all stakeholders, trust in the partnership, and dynamic adjustments as needed over the Prepare, Do, Share Conceptual Framework (Figure 5). This dissertation will describe how expertise was grown, trust fostered, and adjustments were made through the RPP exploration of teacher retention in Nebraska.

Figure 5

Showcased RPP Conceptual Framework

PREPARE
Goal Free Approach

Adjust
Trust
Expertise

- The Question
- Data Availability
- Roles, People, and Process
- Laws and Policies
- Plain Language

DO

Adjust
Trust
Expertise

- Explore and Clean the Data
- Add and Subtract Data
- Modeling

SHARE

Adjust
Trust
Expertise

- Conclusions
- Share Results
- Meta Review
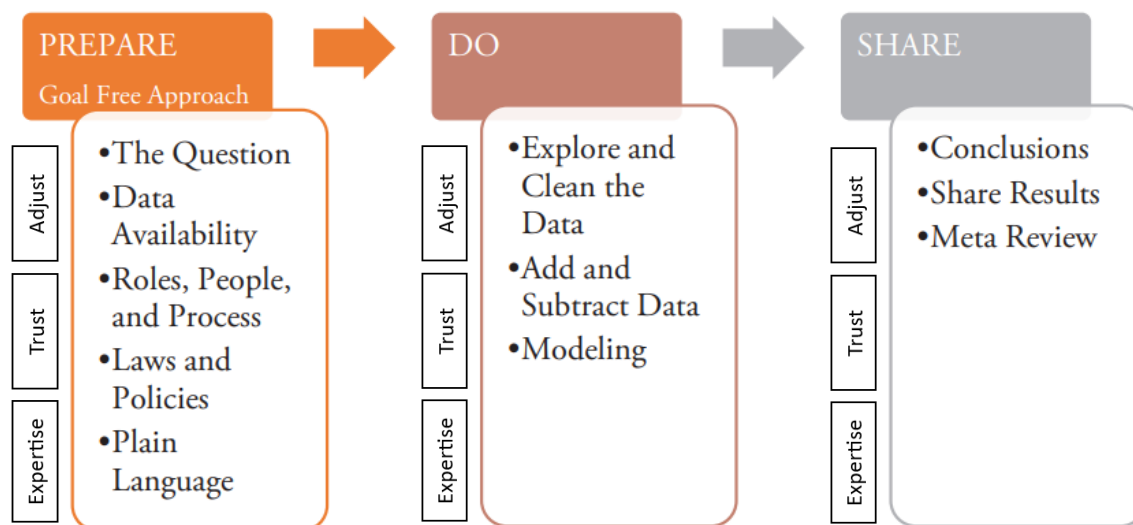
(Modified from Williams et al., 2020)

Chapter two literature will address the topics associated with the showcased problem of practice: teacher attrition and retention. Chapter three describes the showcased RPP experience, including insights on collaboration and the implementation of Nebraska Education Policy Research Lab (NEPRL). Chapter four summarizes the full teacher attrition and retention conclusions and provides recommendations for future studies on this topic. Finally, chapter five provides recommendations for future Research-Practice Partnerships in the NEPRL context.

Chapter 2

Introduction

At the time of this dissertation, significant attention has been drawn to the teacher

shortage and what is called the Teacher Pipeline. Typing "Teacher Shortage" into an

internet search engine quickly provides hundreds of articles written in the last year on the

topic. The headlines read: "Wisconsin Teacher Shortages, Recruitment Efforts Doubled"

(Van Zelst, August 31, 2023), "Are Pay Raises Helping to Address Kentucky Teacher

Shortage?" (Ford, September 2nd, 2023), and "From 'Crisis' to 'Catastrophe,' Schools

Scramble Once Again to Find Teachers" (Pettypiece, August 13, 2023).

States around the country are reporting historically high teacher attrition rates.

Pennsylvania lost 7.7% of its teachers in 2023, that was the largest teacher exodus in

history for the state (Fuller, 2023). The state of Washington had a teacher attrition rate of

8.91%, which was the highest rate in 37 years (Goldhaber & Theobald, 2023). All while

the number of students graduating with education degrees has continued to decrease over

the last 50 years (Institute of Education Sciences, n.d.).

Teacher shortages are a nationwide issue that are partially caused by high rates of

teacher attrition. The topic needs to be researched and addressed so that solutions can be

found.

Teacher Attrition and Retention in Nebraska

To establish a purpose for this study, a need for research to study teacher

attrition in Nebraska needs to be established. This section will dive further into

the concern of teacher attrition and the alarming shortage that exists. It has

become so alarming that the topics of teacher attrition, mobility, and retention

have been studied extensively over the last half century. A simple internet search

will result in thousands upon thousands of articles, papers, and books written about the concern of teachers leaving the profession and the lack of new teachers to fill those positions. This dilemma for the education system was amplified by the impacts of the Covid-19 Pandemic that closed many schools at the end of the 2019-20 school year and heavily impacted the next two years of schooling.

A national survey from RAND Corporation in January 2021 found that nearly one in four teachers were planning to leave their job at the end of the 2020-21 school year. Recent statistics in Nebraska are similar to what is occurring nationally. Wagner (2022) found that more than 1,250 educators were leaving their districts in the metropolitan area of Omaha, Nebraska. This was a 41% increase from the year prior. These findings came on the heels of Modan's findings (2021) where a survey of 6,000 teachers in Nebraska found that nearly half of them (48%) considered changing jobs during the 2021-22 school year. Most of them were considering career change, with the most prominent reasons for leaving were anxiety, stress, and burnout. Modan cites the COVID-19 Pandemic as playing a prominent role in such high numbers of teachers considering leaving their job. Unfortunately, this is not a new problem caused by the COVID-19 Pandemic. Nationally, teachers have been leaving the profession at alarmingly high numbers for years. Prior to the COVID-19 Pandemic, approximately 13-16% of teachers nationwide left their current position each year. Similar statistics were found for the State of Nebraska (Ingersoll, 2003; Goldring et al., 2014; Meyer et al., 2019; Steiner & Woo, 2021).

Teacher recruitment and retention is a concern in Nebraska. According to the Teacher Shortage Survey done by the Nebraska Department of Education (NDE), the number of unfilled teaching positions continues to trend upward and the student

enrollment in teacher preparation programs is falling (Offner, A., 2023; Skretta, S., 2023). The 2022-23 Teacher Vacancy Survey was conducted in the fall of 2022 to determine areas of shortage. This is a national survey in which each state reports their area of shortage to the US Department of Education to be considered for loan forgiveness. For the 22-23 school year, Nebraska had 17 areas of shortage including Art, Career and Technical Education, Early Childhood, Elementary, English as a Second Language, Health and PE, Language Arts, Math, Music, Counselors, Library, School Psychologist, Special Education, Social Studies, Science, Speech, and World Language.

In the fall of 2021, the Nebraska Association of Colleges for Teacher Educations (NACTE) held an Educator Shortage Summit to gather educational leaders from around the state with the hopes of creating an action plan to address the concern (Dahlgren, T., 2021). The group decided to create four task forces to further their mission. Those task forces are set to explore Teacher Certification pathways, the Praxis test requirement for teachers, recruitment and retention, and marketing to elevate the profession. The group plans to reconvene in the Fall of 2023 for another summit to continue to discuss the action plan and share innovations. This RPP can hopefully help support the work of these summits, specifically the recruitment and retention task force.

Impacts of Teacher Attrition and Mobility

Most often, when teachers leave their role, it has a negative impact. The negative impact can affect the students, the school, the community, and the teacher. Of course, there are instances where teacher turnover is a positive event. A school losing a low-achieving teacher or having a high-achieving teacher take a leadership role, can be beneficial. Other times having a teacher find a job that is a better fit can increase their

chances of staying in the profession and becoming a stronger educator. However, a large amount of turnover causes instability in schools and districts and it has a negative impact on students. Han, Bobbitt, and Ingersoll (1995) wrote that high turnover is a concern because of its negative relationship to organizational performance. When teachers leave, whether leaving the profession or transferring, it has a negative impact on the school, the district, and the students experiencing the vacated position. The districts spend valuable hours and resources on recruiting and training teachers that are new to their school, while the school and students are impacted by a loss of culture and knowledge. In this section, the negative impacts of teacher attrition and mobility will be explained.

Student Impact of Teacher Attrition and Mobility. Darling-Hammond (2003) wrote "substantial research evidence suggests that well-prepared, capable teachers have the largest impact on student learning" (p. 7). Unfortunately, when teachers decide to leave or transfer, they are often being replaced by less qualified teachers, teachers who are trained in another field or grade level, or substitute teachers (Ingersoll, 1998). This is an issue because teachers are the biggest single factor on student achievement. Sanders and Rivers (1996) researched teachers in Tennessee and the impact they had on student achievement based on the scores from the state assessment, the TCAP. They found that low achieving students in the classes with teachers who were deemed most effective were expected to gain 52 percentile points in a one-year span. Compare that to low achieving students in the classes with a teacher who was classified as least effective who would only expect a 14 percentile gain over the course of a year.

Other research has found that when teachers are continually turning over, it has a negative impact on student achievement (Gibbons et al., 2021; Sorensen & Ladd, 2020;

Boyd et al., 2008). Barnes et al. (2007) writes, "It stands to reason that student achievement will suffer when students are continually faced with a parade of inexperienced teachers. In a vicious cycle, teacher turnover lowers student achievement, and lower student achievement leads to teacher turnover" (p.8).

Kraft, Marinell, and Yee (2016) analyzed middle schools in New York City, N.Y. and considered nearly 300 schools with more than 16,000 teachers and almost 54,000 students. They found that when teacher retention increased, it increased student achievement. Gibbons et al. (2021) found similar results. In their study, they concluded that students who had more exposure to teacher turnover scored lower on standardized tests than students with less exposure.

Ronfeldt et al. (2013) also did research in New York City, looking at eight years of student achievement data, and found that student achievement in math and reading is negatively impacted by teacher turnover, primarily in low-performing schools. They also found that even the students of staff members who had remained at the school were negatively impacted when the school had a higher rate of turnover, showing that students are harmed by the changing composition, even if it is not their teacher who leaves. "The results suggest there may be a disruptive impact of turnover beyond compositional changes in teacher quality" (p. 31). This is further explained by Sass et al. (2019), "when teacher turnover is high, teachers may not develop an identity with the collective of the school. In turn, they may allocate their help or other resources only to specific colleagues that they have come to trust. The result is that resources such as curricular materials or local knowledge become isolated in pockets within the school, restricting the flow from where it could be most valuable." These points emphasize that teacher turnover does not

just impact students in those classrooms. Students who retain their teacher are still impacted by teacher turnover because of the effects turnover can have on a teaching team and the overall school culture.

School Culture Impact of Teacher Attrition and Mobility. A school's culture can take years to develop and is driven by the building leadership and staff. As staff members exit, pieces of the culture are lost with their departure. The new staff entering needs to be indoctrinated to the school culture and then given time to adjust to fit in with the culture. Losing established teachers typically will negatively impact the overall culture of the building that the teacher is leaving (Ingersoll, R. M., 2001). Sorensen & Ladd (2020) found concern with the influx of new and inexperienced teachers disrupting a school's ability to develop a coherent program of education within a school. Johnson and Birkeland (2003) wrote, "Losing a good teacher – whether to another profession or to the school across town – means [losing the] teacher's familiarity with school practices; experience with school's curriculum; and involvement with students, parents, and colleagues" (p. 21). Creating a sense of community among students, staff, and families is one of the most important indicators of a successful school (Ingersoll, 2001; Han, Bobbitt, & Ingersoll, 1995). Han et al. (1995) writes, "Good schools are marked by stability, continuity, and cohesion." It is difficult to create a sense of community with high rates of teacher turnover.

Cost of Teacher Attrition and Mobility. Teacher attrition and mobility is expensive, which is of concern to districts and policy makers since schools already have tightened budgets. When teachers leave, there is an extensive and costly process to attract new teachers which includes advertising, recruiting, incentivizing, administrative

processing, training, and then a mentorship or induction program (Barnes et al., 2007).

Nationally, the price tag to recruit, hire, and train teachers is $8.5 billion dollars each year

(Hillard, 2022).

Looking on a smaller scale, The Learning Policy Institute (2017) estimates that

teacher turnover costs districts about $20,000 per teacher. These numbers are based on

the cost of advertising, resources used, and the hourly wages of those tasked with

recruiting, interviewing, and training the new employees. Teacher turnover is costly,

especially for schools that are experiencing it at a high rate. New teacher acquisition is an

expense that can be reduced with an emphasis on retaining teachers.

Teacher Impact of Teacher Attrition. Often left out of the conversation of the

adverse effects of teacher attrition and mobility is the impact it has on the teacher. It is

unlikely that teachers start their teaching assignment hoping that they will leave it for

another role. Since teacher attrition and mobility is often attributed to a dissatisfaction

with the job they have, the teacher's emotions and mental state should be considered. Not

only is the teacher dealing with the dissatisfaction of the role they are exiting, but they

also must take the time to apply, interview, and then acclimate to a new role. The entire

process can be exhausting for the teacher.

As teachers transfer to new districts, there are many changes that can occur in

addition to being in a new setting. Financially, teachers may lose their placement on the

pay scale or lose the investment in the local retirement system. If the transfer is across

state lines, it could create barriers that include loss of tenure, new certification,

assessments needed for certification, and additional coursework (Reeder, L. S., 1986).

When a teacher makes the difficult decision to leave their role, it is not just the schools that are impacted, the teacher is also impacted in many ways.

Literature That Explores State-wide Data

This RPP will explore statewide data that is provided by the Nebraska Department of Education. Studies that have conducted similar research in other states are especially relevant to this research. This is particularly true of midwestern states with demographic patterns similar to Nebraska. The state of Kansas is discussed first, followed by Texas, Michigan, Kentucky, and West Virginia. Much of the research found in this chapter utilizes information found from two surveys created by the United States Department of Education, the Schools and Staffing Survey (SASS) and the Teacher Follow-up Survey (TFS). These surveys were administered every 3 to 5 years from 1987 to 2013. The SASS was initially administered and then the TFS administered a year later (Hancock, 2009). Since 2015, the U.S. Department of Education has used the National Teacher and Principal Survey (NTPS). Table 1 is a summary at the end of this section for the states presented.

Kansas. Nguyen (2020) explored teacher attrition and mobility patterns in the state of Kansas based on SASS data from 1988 to 2012 and used the data in a variety of ways. First, Nguyen compared Kansas to surrounding states with similar population densities, ones having a large rural population but also have large metropolitan areas. The research compared Kansas to states in the Central and North Central regions of the United States, along with the US in its entirety. This study also compared the teacher population in the rural areas of Kansas to the statewide data to see if there were any major differences. Many criteria were considered including employment status (leavers,

movers, and stayers), teacher characteristics (gender, ethnicity, age, graduate degrees, teaching assignment, where they attended college, salary, and union membership), and school characteristics (urban or rural, enrollment size, school level, percent of free/reduced lunch, minority population, percent of students with IEPs, percent of students in ELL, student discipline, administrative support, and teacher cooperation).

Nguyen's findings for Kansas were consistent with national trends, that younger teachers are more likely to leave their current role, as are teachers without graduate degrees, Special Education teachers, and teachers who are not union members. When the study focused on rural schools, some results differed. In rural schools, there was not a significant increase in risk of turnover for young teachers and Special Education teachers. Most of the other trends that were true of Kansas in its entirety were also true for the state's rural teachers.

Texas. Sass et al. (2012) conducted similar research with teachers in Texas, using various characteristics to determine the probability of teacher attrition. The study used teachers that started teaching in Texas between 1988 and 2010 and stopped teaching by 2010. Teacher characteristics that were examined were gender, ethnicity, age, tenure, content area, salary, and teaching assignment. School district characteristics that were considered were location, school type, school level, school accountability status, and timing of state testing mandates.

The results of this study were consistent with national research that currently exists on teacher attrition. This study found that young teachers, teachers of math and science, Black teachers, and teachers from low achieving schools all have a higher probability of attrition compared to the entire teaching workforce. However, other

findings were unique to this study and not found in similar studies. This research found that teachers who enter the profession later in life (after the age of 30) have a lower probability of attrition. The research also found that foreign language teachers have an extremely high probability of attrition. Of the foreign language teachers that entered the profession during this study, less than 1% of them were still in the classroom after ten years. Another interesting finding of the research was that high school teachers at high performing schools had a higher probability of attrition than high school teachers at low performing schools. Many hypotheses were given as to why this may be true, but there is not significant evidence to support these hypotheses.

Michigan. Minor et al. (2019) completed a longitudinal study of the teacher attrition patterns of high school teachers in the state of Michigan from 2004 to 2011. This study puts an emphasis on two major events that occurred in this time frame, a state-wide curricular change and a national economic recession. It also considered the locale of the schools in the study, differentiating between suburban, urban, towns, and rural locations.

The authors argue that using longitudinal information provides a better description of fluctuations in teacher turnover "resulting in a fuller understanding of trends in teacher turnover" (p. 3). It is also suggested that considering the location of schools is critical because the opportunities and constraints on the labor market can vary greatly within each setting of suburban, urban, towns, and rural communities.

When laying the data trends against local educational context timelines the author observed that two major events impacted teacher attrition and mobility. The first was a change in state graduation standards, which put a higher emphasis on math and science curriculum. This change led to a significant increase in teacher attrition the following

year. The other event was the recession that took place from 2007 to 2010. The study found a significant increase in teacher attrition in 2010. During this 8-year study, teacher attrition percentages ranged from approximately 5% to 13%. In 2006 and 2010, the attrition percentages were 16.7% and 16.2%, respectively.

This study also looked at trends linked to teacher and school characteristics. The list includes county unemployment rate, student mobility rate, leadership instability, percentage of students on free/reduced lunch, percentage of Black students, school size, percentage of full-time teachers, and percentage of novice teachers.

Minor et al. identified many limitations of this study. First, was a lack of understanding why teacher attrition occurs, especially the consideration of voluntary and involuntary attrition. They also speculated that teacher turnover can lead to cycles of more teacher turnover. Teacher attrition and mobility could lower the quality of the workplace for teachers that did stay by increasing teacher isolation, creating a lack of resources, and impacting the school community.

Kentucky. Lochmiller et al. (January, 2016) researched teacher retention, mobility, and attrition in the state of Kentucky from 2008 to 2012. They found that 14.4% of teachers transferred to a different school (6%) or left Kentucky public schools (8.4%). There was a higher rate of attrition from teachers ages 31 or younger and 50 or older. Regarding teacher mobility, teachers in schools with a higher population of students eligible for the school lunch program moved to a different school at a higher rate than their counterparts where less students were eligible for the lunch program. Regarding attrition, teachers left the public schools at similar rates regardless of school characteristics.

West Virginia. Lochmiller et al. (August, 2016) researched teacher mobility and attrition in the state of West Virginia from 2008 to 2013. They found that 9.9% of teachers transferred to a different school (0.9%) or left West Virginia public schools (9.0%). For teachers who started teaching in 2008, 32% had left the public school system four years later. They also found that teachers with the highest salaries and lowest salaries were the most likely to leave the public schools, probably attributed to new teachers leaving and retirements. Furthermore, regarding attrition, schools with higher rates of students eligible for the free lunch program had higher attrition rates.

These sources provide information and considerations on how to conduct research and provide guidance on what questions to ask and data to explore. They also provide some comparable data that will be helpful in the interpretation of the Nebraska findings.

Table 1

Summary Statewide Literature

Author	State	Findings	Still Needed to Explore
Nguyen (2020)	Kansas	• Younger teachers are more likely to leave • Teachers without graduate degrees are more likely to leave • Rural schools did not see a significant increase in turnover from younger teachers or Sp. Ed. teachers	• Where teachers are relocating to when they leave their school • Salary impacts on satisfaction • What other mechanisms can be used to reduce attrition and increase recruitment
Sass et al. (2012)	Texas	• Teachers with high probability of leaving are young, teach math and science, Black, and at low achieving schools • Teachers who begin after age 30 are less likely to leave the profession	• How does job satisfaction, stress, and administrative support impact attrition • How does teacher preparation, mentoring, and education impact attrition

		• Foreign Language teachers have an extremely high attrition rate • High school teachers are high performing schools had higher attrition than teachers at low performing schools	
Minor et al. (2019)	Michigan	• Attrition increased after the recession of 2007 to 2010 • Attrition increased after the state changed the graduation standards	• Why teachers left the profession was not explored • Can teacher turnover lead to a cycle of more teacher turnover
Lochmiller et al. (January 2016)	Kentucky	• Attrition (8.4%) and mobility (6%) rates are consistent with national trends. • Teachers 31 and younger or 50 and older are more likely to leave • Teachers are more likely to transfer from schools with high poverty • Teacher attrition rates were consistent regardless of school characteristics	• Years of experience were not considered and could have been • Considering teacher transfers within district compared to transfers out of district
Lochmiller et al. (August 2016)	West Virginia	• 9.9% of teachers either left the public school system (9%) or transferred (0.9%) • 32% of new teachers had left the public school system after four years • Teachers with the highest and lowest salaries left at the highest rates	• Why individual teachers left or moved to a different school • Data was lacking on whether teachers left permanently or returned to teaching after time off • The level of effectiveness of the teachers who left and of the ones who stayed

National Trends

After reviewing some state-level data, there are many pieces of research that have looked at trends on the national level. National research has shown that teachers tend to leave schools that have higher rates of poverty, higher rates of minority students, and

schools that are low performing (Ingersoll, 2001; Ingersoll, 2001a; Provasnik & Dormfman, 2005; Barnes, Crowe, & Schaefer, 2007; Boyd, Grossman, Langford, Loeb, & Wychoff, 2008, Falcon, T. & Ronning, M., 2007, Boyd, Grossman, Langford, Falch, T., & Rønning, M., 2007; Loeb, & Wyckoff, 2008; Giefsen & Gunnes, 2020; Pivovarova, M. & Powers, J., 2022).

When considering previous research on this topic, there are some recurring themes. Johnson, S. M., & Birkeland, S. E. (2003) found in a study of fifty new teachers in Massachusetts that voluntary movers were searching for better working conditions and opportunities to work with better staff and administrators. The teachers identified dissatisfaction with school administration more than any other factor. Other studies found similar results where job dissatisfaction is linked to lack of autonomy/empowerment, student discipline, lack of administrative support, work conditions, and salary (Ingersoll, 2003; Provasnik and Dorfman, 2005; Kukla-Acevedo, 2009, Boyd et al. 2011). These reasons, and others, will be further explained in the literature review to follow.

Lack of empowerment/autonomy. In the last few decades there has been a push by the federal government to standardize education to increase accountability across the country with a goal of having all students taught and tested over the same information. This helped provide comparable test scores to establish which schools are doing well and which ones need improvement. These policies led to an increase in standardized testing and nation-wide curriculum implementations, with an emphasis on raising test scores and student performance levels. This standardization and loss of autonomy caused some teachers to lose the intrinsic motivation to teach, leading to teacher attrition and mobility

(Ingersoll, 2001; Ingersoll & Smith, 2003; Luekens, Lyter, & Fox, 2004; Giefsen & Gunnes, 2020).

Similarly, many teachers leave their role because of a lack of teacher empowerment. Many teachers want to have input on curriculum, school culture decisions, and changes within the building or district. Some teachers want to be leaders within their buildings, whether as teacher leaders, committee members, or instructional coaches, for example. When these opportunities are not provided and teachers report a low level of control and influence, it leads to a decrease in satisfaction and the turnover rates are higher (Ahrari et al., 2021; Han, Babbitt, & Ingersoll, 1995; Ingersoll, 2001; Conley, 2006; Provasnik & Dorfman, 2005).

Ingersoll, R. & May, H. (2012) found that teachers were less likely to depart from schools where teachers reported a higher level of school wide faculty decision making and higher average levels of individual teacher classroom autonomy.

Accountability. The recent push of standardization and accountability not only impacts teacher autonomy, but it also puts more accountability on teachers and schools through labeling, which can impact a teacher's desire to stay or leave their school building.

In Florida, an accountability system was implemented so each school earns a letter grade based on their school's test scores. Feng, Figlio, and Sass (2017) found that schools who narrowly missed a grade of a "D" and were assigned an "F" saw 4-7% higher teacher turnover rates. In addition, schools who lowered their letter grade from one year to the next had an increase in teacher attrition in the year after the new grade was established.

Ingersoll et al. (2016) found that when schools were given rewards or sanctions for their performance on assessments, schools given rewards saw little impact on their retention, but schools given sanctions saw a negative impact on their retention. "One of the most consequential sanctions for teacher turnover was a school being put on an evaluation cycle with specific deadlines for improvement." (p.48). Low performing schools with sanctions saw significantly higher turnover than low performing schools without sanctions.

Although assigning grades to schools can increase teacher attrition and mobility for schools that earn lower grades, it is worth noting that research is not in total agreement. Dizon-Ross (2020) completed a study in New York City that conflicts with this notion. The accountability program implemented in NYC resulted in schools with lower grades having lower teacher turnover. Dizon-Ross speculated that there could be a couple reasons for this lowering of teacher turnover. First, teachers in low-scoring schools have a harder time transferring due to the stigma that comes with working in low-graded buildings. Teachers become less desirable to other schools and districts if they work in a school that consistently earns a lower grade. The other hypothesis was that when a school scores low, the district provides support and leadership to the building that make it more attractive to work in. When the principal is under pressure to improve the school, it leads to changes that appeal to teachers, causing them to stay, lowering their turnover rate.

Boyd et al (2008) found similar results when New York implemented state-mandated testing in the fourth grade. The state saw a decrease in turnover among fourth grade teachers after the implementation.

Ingersoll and Tran (2023) examined the results from the Schools and Staffing Survey (SASS) and the National Teacher Principal Survey from the years 1987 to 2018. They separated their results by locale into three categories: Urban, Suburban, and Rural. They found that in all three locales, the top reason for teachers leaving their role was Dissatisfaction, with the highest percentage being in Rural Schools. When those teachers were asked what was the cause of Dissatisfaction, "Dissatisfaction with Testing/Accountability" was the most common among teachers in Urban and Suburban schools and second most common among Rural teachers (the most common answer being Dissatisfaction with Administration).

School Culture. Many decisions impact the culture of a school but there are specific factors that teachers have cited as the reason they left or wanted to leave their role. Dissatisfaction with workplace conditions and the culture of a building are leading causes of teacher turnover (Kraft, Marinell, & Yee, 2016; Luekens, Lyter, & Fox, 2004).

Dissatisfaction with school administration is frequently listed as a reason for teacher turnover (Ingersoll, 2001; Luekens, Lyter, &. Fox, 2004; Ndoye, Imig, & Parker, 2010; Dizon-Ross, 2020, Player et al., 2017). Conley (2006) found that school leadership was the key reason that teachers chose to leave their current roles. He wrote, "(Teachers) leave after a series of experiences and behaviors affect them in a way that sets up either a personal or philosophical conflict with either the administration or other educators" (p. 98). Kukla-Acevedo (2009) found that the odds of a teacher leaving their current role decreased by 17% when there were increases in perceived administration support. Consistently, Ingersoll, R. & May, H. (2012) found that teachers who reported more

positive levels of leadership support than others in the same building were less likely to leave.

Connecting to culture and administrative support, the stability of the school leadership also impacts teacher attrition and mobility. When there is significant leadership turnover, high teacher turnover follows. The stability of a principal has a positive relationship to teacher stability in school buildings (Barnes, Crowe, & Schaefer, 2007).

Aside from leadership, student behaviors are a major component of a school's culture. When teachers leave the profession, they frequently cite student discipline issues as the reason (Boser, 2000; Ingersoll, & Smith, 2003; Han, Babbitt, & Ingersoll, 1995). Discipline issues are influenced by administrative support, so it can be difficult to discern if these two issues are the same or differ, because they frequently overlap. Harrell et al. (2019) did a 5-year study of 76 teachers and found that there was not a correlation of teachers leaving to a school's poverty level, racial demographics, or test scores. However, what was found is that when a building had a high number of discipline infractions, that greatly increased the likelihood that a teacher would transfer schools. These findings were similar to research by Ingersoll and May (2012) who found that schools with lower rates of discipline problems had distinctly lower turnover rates.

Teachers also cite student achievement and motivation as a reason for not wanting to remain in their current role. Boyd et al. (2008) found in their research that highly effective teachers are four times more likely to transfer if working in a low-achieving school compared to teachers working in a high-achieving school. Low student motivation coincides with low student achievement, and it can be difficult to separate the two.

Schools with low achievement tend to have higher teacher turnover. Whether the reason is to work with students with higher motivation or students with higher achievement (often the same student), there is a trend that teachers leave low achieving schools to work in high achieving schools (Giefsen, & Gunnes, 2020; Dizon-Ross, 2020; Boyd, Grossman, Langford, Loeb, & Wyckoff, J. 2008).

Teachers also tend to seek out peers who are like themselves. Feng and Sass (2017) found that teachers in the top quartile of teacher quality tended to stay at a school if they were surrounded by teachers of similar quality. Feng and Sass wrote, "Teachers who move tend to go to a school where the average teacher quality is like their own" (p.412).

Hanushek, Kahn, and Rivkin (2004a) found that working conditions mattered more to teachers than salary. Their analysis found that teachers were willing to take a small pay cut in order to move to schools with higher achieving students and students from higher income families. They concluded that some teachers in large urban school districts would require a 25% increase in compensation to be convinced to stay in a school with difficult working conditions.

There are many contributors to school culture. The portions of it listed in this section (administrative support, student behavior, student motivation, and staff) are not an exhaustive list of what contributes to culture or why teachers are unhappy with culture, but these are the most cited factors.

Lack of New Teacher Training. This study previously discussed that there is a high amount of teacher turnover within the first few years of teachers' careers. Researchers have looked closely into what supports new teachers receive to encourage

them to stay. When teachers are given supports in the form of a well-implemented new teacher training program, the rate of teacher retention increases (Keese et al., 2023). Successful programs provide new teachers with mentors, time to collaborate with teachers in the same field, and a network of teachers in other content areas. When these supports are provided, teachers are less likely to leave their role at the end of the year (Keese et al., 2023; Ingersoll & Smith, 2004). If there is not an induction program at all, there are increased chances of teachers leaving the building (Boser, 2000).

Gehrke and McCoy (2007) studied new teachers in rural communities and the difference in experiences between those that stay and those that leave. When asked about resources of support available to them, the teachers that stayed listed more resources of support, on average, than teachers who left. Gehrke and McCoy found that teachers who stayed were more likely to have a person in the building as a primary resource of support.

Salary. A popular topic of discussion at the national level is teacher pay. Ingersoll (2001) found that teachers in schools with higher salaries were less likely to leave. He wrote, "for example, an increase of $5,000 in the normal salary provided to teachers with a master's degree and 20 years of experience is associated with a 4% decrease in the odds of a teacher departing" (p. 17). A 2022 survey done by Joblist, a job search platform, found that of educators who quit their last job, 26% of them left due to low pay or lack of benefits (Hansen, 2022). Higher teacher salaries are associated with lower levels of teacher turnover (Han, Babbitt, & Ingersoll, 1995; Dolton, & van der Klaauw, 1999; Luekens, Lyter, and Fox, 2004; Gulosino, Ni, & Rorrer, 2019).

A component of the salary conversation is performance pay. Not only do schools want to retain teachers, but they want to retain high quality teachers. Performance pay is

when teachers earn bonuses or salary increases if they can meet a set of criteria to show that they are a high performing teacher. The criteria vary from district to district, but it typically includes standardized test results and evaluation from administration. The implementation of performance pay or financial incentives has shown to decrease teacher turnover, specifically with high performing teachers (Luekens, Lyter, & Fox, 2004; Jones, 2012; Dee & Wyckoff, 2015; Cullen, Koedel, & Parsons, 2017). This reinforces that salary can be a factor in whether a teacher will leave.

Clotfelter et al. (2008) found that offering teachers in high needs areas (Math, Science, and Special Education) an annual bonus for working in high need schools resulted in a 17% reduction of teacher turnover within the targeted teacher population, suggesting that an increase in salary can positively impact teacher retention.

Additional Reasons. It is important to mention that there is teacher attrition and mobility that occurs for reasons not always within the teacher's control or related to their satisfaction at work. Almost 40% of teacher attrition and mobility is for personal reasons such as health, family, and moving. There are also teachers that migrate involuntarily, which is true for about a third of all teachers that transfer to a new school (Goldring, Taie, & Riddles, 2014). These involuntary transfers can be automatic reassignment, staff reduction, or school closure.

Many teachers also leave their role to pursue another role within education. Some teachers that leave the classroom take a new role where they are still employed by a public school but in another capacity. This can mean career advancement to a new role such as instructional coach, teacher leader, or administrator (Chingos, & West, 2012; Boe, Bobbitt, & Cook, 1997).

Chapter 3

In a traditional dissertation format, this chapter typically outlines the methods used in the dissertation study. However, as stated earlier, this dissertation addresses two concepts: highlights a specific example of Research Practice Partnerships *and* presents the results of the investigation of Nebraska's Teacher Pipeline. As such, chapter three describes the showcased RPP experience, including insights on collaboration and the implementation of Nebraska Education Policy Research Lab (NEPRL). Chapter four summarizes the full teacher attrition and retention conclusions and provides recommendations for future studies on this topic. Finally, chapter five provides recommendations for future Research-Practice Partnerships in the NEPRL context.

Showcased RPP Context

The showcased RPP is the Nebraska Education Policy Research Lab (NEPRL). NEPRL is a collaboration between the Nebraska Department of Education (NDE) and researchers at the University of Nebraska. It was established as a learning lab to conduct rigorous research for the purpose of developing a body of evidence-based policy solutions that can be shared and applied widely within the Nebraska education system. Locally for this project, the collaboration was specifically between two departments: Educational Leadership and Mathematics Data Science. Through the NEPRL, graduate students have been exposed to inter-departmental and inter-program collaboration. Previous NEPRL studies have investigated statewide topics such as perception of teacher preparation by candidates and their supervisors, math course taking patterns by high school students, and relationship between school attendance and state testing from 3rd –

12th grade. This chapter describes the NEPRL experience in the investigation of Nebraska's teacher pipeline.

Research Questions

Specifically, this study investigates two central questions:

1. What are the mobility and attrition trends of certificated Nebraska public school employees from 1982 to 2021?

2. Do these trends vary by role and demographics?

This chapter describes how the NEPRL RPP process was realized in order to investigate these two central questions.

Framework

The Prepare, Do, Share conceptual framework shared in figure 5 will be referenced throughout this chapter.

The Question

Like all parts of the RPP process, the development of the question was a collaborative process. In the Spring of 2022 at the University of Nebraska-Omaha, it was observed that there was a small group of Educational Administration doctoral candidates all exploring different components of the teacher pipeline. Each one had a slightly different emphasis, such as teacher retention, recruitment and retention of minority teachers, teacher induction programs, and so on. This group of doctoral candidates was nominated to be a part of the Nebraska Education Policy

Research Lab to focus on the Nebraska Teacher Pipeline. The five doctoral candidates were paired with graduate level statistics students also from the University of Nebraska at Omaha in a Research-Practice Partnership with the purpose of exploring Nebraska's statewide teacher data, finding trends in the data, and identifying inferences and deductions that can influence statewide policies and practices.

To create cohesion amongst the doctoral candidates and the statisticians, the EdD students collaborated on locating relevant literature, current national data trends in regard to the teacher pipeline, and possible questions to consider when looking through the data. First, each candidate wrote a literature summary to share with the statisticians to help gain an understanding of the current state of the teacher pipeline. In addition, specific articles from the literature review were provided to the statisticians that were of utmost important to the pending research or provided similar structures and equations that would be used. The purpose of sharing teacher pipeline literature and possible research questions was to build shared content expertise between Educational Leadership students. Also, this literature was a resource for the peer graduate statistics students and provided the statisticians with the proper background knowledge and context to be able to gather serviceable information from the information database of the Nebraska Department of Education.

Next, the candidates within the Nebraska Education Policy Research Lab collaborated to formulate questions that they were hoping to have answered throughout this research. They established more than 80 questions that were sought to be answered through collaborative research. The list consisted of questions such as "How do rural and urban schools compare in teacher attrition rates?" and "What is the average age of

teachers that migrate to a new building or district?" The questions were then categorized into five categories: recruitment, identification, development, migration, and leave. The categories were created so that each participant in the Research Lab could take questions in a category and give focus to their research. The questions that were the focus of this specific RPP were in the categories of Teacher Migration and Leave. With five students and over 80 questions, we each needed to adjust our specific inquiries. The brainstorming process allowed the group to consider many threads of inquiry. All five students narrowed and refined the final question(s) for each specific study.

Roles, People, and Processes
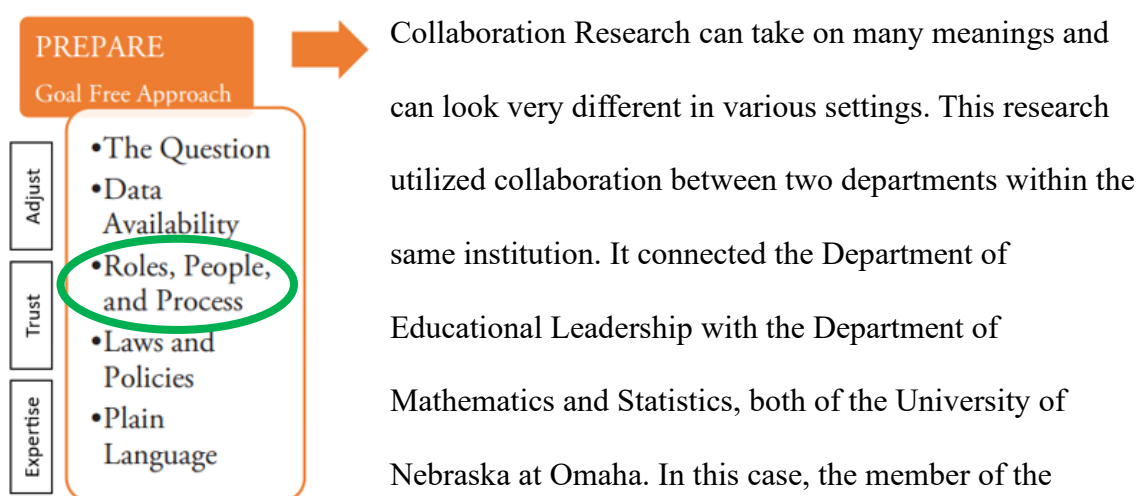
Collaboration Research can take on many meanings and can look very different in various settings. This research utilized collaboration between two departments within the same institution. It connected the Department of Educational Leadership with the Department of Mathematics and Statistics, both of the University of Nebraska at Omaha. In this case, the member of the Department of Educational Leadership was also a practicing Principal during the research process. The member of the Statistics Department was a researcher working on a graduate-level thesis. The two members of this partnership explored the State of Nebraska's Department of Education data, which required a deep understanding of statistics from the statistician, including how to cleanse, manipulate, analyze, and interpret those statistics to uncover patterns. However, it also required knowledge of the

data set and an understanding of what the data represented, which came from the principal. Both members' expertise was essential.

Regular meetings were held with both students and their faculty advisors. Because of varied schedules, the meetings of all four members of this RPP project were held online. The expertise of the statistics faculty member drove much of the week-to-week data work. For example, the principal and Educational Leadership faculty were originally interested in the impact of many variables on teacher attrition such as gender, size of district, years of experience, race and ethnicity, and highest degree. However, the wisdom and expertise of the statistics faculty member helped guide the process of data cleaning and building shared understanding of the data set. With hundreds of thousands of pieces of data, slowing down and narrowing the focus became a very clear need. The original research inquiry adjusted and was narrowed to gender and role category.

Through the regular meetings, the principal and statistics student built trust with their advising faculty and each other. The purpose of the partnership is to lean on each other's strengths and learn new skills together. Thus, a sense of humility and identity as learners together helped set a mindset of trust.

Laws and Policies
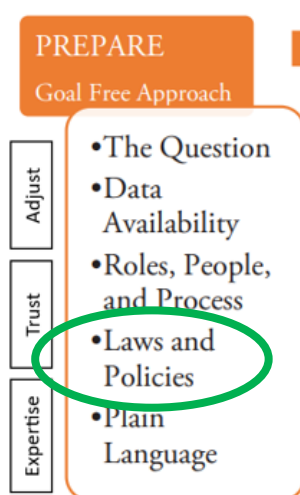
Federal law and University policy provide guidance for data security and educational data. The research team followed several protocols to ensure data security. All researchers hold certification in data ethics, the data set was deidentified with the master key held at NDE, and data was accessed on the secure, online storage without downloading any data set.

Miles et al. (2020) suggests three pieces of advice while doing research: anticipation, third parties, and regular checking and renegotiation. Anticipation is a broad concept because there are many things to consider, including worthiness, competence, consent, benefits, risks, privacy, integrity and use of data. Much of the anticipation for this research has been done in collaboration with the Nebraska Educational Policy Research Lab due to their expertise. We have established that there are minimal risks within this study. Similar studies may be concerned about the privacy of the teachers whose data will be examined. However, given there will not be any identifying information used, and based on the length and breadth of the study, it will be impossible to identify any individuals. The integrity and use of the data were all determined by the Lab in consultation with professors in the University of Nebraska Omaha Educational Leadership program. The use of the data will be available for public consumption but will be targeted to state lawmakers, Nebraska Department of Education, school boards, superintendents, district administrators, and building administrators.

Third parties will be introduced throughout and at the end of this study. This research will also be shared with colleagues in the educational field informally to provide various perspectives and ideas.

Regular dialogue was held throughout the collaboration process with the regular meetings between practitioners and statisticians. Additionally, this work was continually shared and made available to other members of the Nebraska Educational Research Policy Lab to use their expertise to provide feedback and checks throughout the data exploration process and writing process.

Data Availability

In 2021, the Nebraska Department of Education (NDE) moved their entire statewide database to a cloud-based data system. According to an article from Microsoft in October 2021, NDE partnered with Microsoft to move all their data on grades, attendance, courses, teachers, and demographics, among other things, to Microsoft's digital database system called Azure. The purpose was to increase efficiency and efficacy for districts, the department, and policy makers. NDE had found that school districts all over the state were using countless man hours to collect and organize data, but it was not being shared among other districts and each district had their own format or system. NDE decided to streamline this process to ease data collection and to create a system that would be useful for all stakeholders and would have real time data immediately upon entry. NDE has uploaded all their data to the Azure cloud and schools
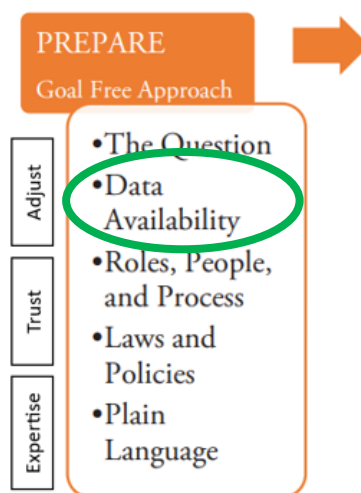
will continue to upload their data to that system regularly through monthly and annual data submission cycles from each district.

NDE has partnered with the University of Nebraska Omaha and the Nebraska Educational Research Policy Lab, by opening their entire Azure database to the Nebraska Educational Research Policy Lab research team, providing copious data points to decipher patterns of teacher attrition and mobility. According to NDE, all data is securely stored.

The data is imported into Azure in spreadsheet format. There are four existing folders: Student Information, Staff Information, Student Performance, and Student Courses. Within each folder exists spreadsheets, one spreadsheet for each year data was collected for that particular data set. It was determined that this study would explore staff data. Student courses is not relevant to teacher retention. Student performance is a topic that could be found relevant to teacher retention but that will be left for future research. It was intended to explore student information but with time constraints the team had to adjust and it was not considered.

Within the folder containing staff information, there is a spreadsheet for each year from 1982 to 2021. Each spreadsheet contains columns with staff characteristics or information that was collected by school districts about their own employees and then submitted to the state. The columns in the spreadsheets are not consistent from year to year. It was also found that some data within consistent columns was not always collected in the same manner or with the same labels.

Plain Language.
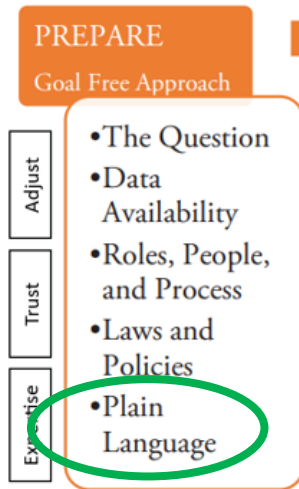
When working in a closed system as a principal, I know how to communicate with a variety of stakeholders. When discussions revolve around curriculum, testing, school safety, or thousands of other topics, there is a lexicon that exists that is widely known amongst educators. Collaboration during this RPP required establishing a shared language and understanding of common terms so that a flow of communication could exist.

As this RPP began, it was clear that the researcher and the practitioner were going to need to share one another's expertise and language in order to have a smooth transfer of ideas. Meeting times were set aside to simply establish vocabulary understanding. When the data set was given to the researcher, time was dedicated to allowing the researcher to identify unknown vocabulary within the data and learn from the practitioner.

There was also a transfer of understanding that was ongoing throughout the RPP. As new ideas were explored, there had to be an understanding of new language being brought into the conversation. For example, as the data in this RPP was being cleansed, the researcher did not understand the organization of school systems and how one district could contain multiple schools with a variety of staffing structures within each. The expertise of the practitioner was needed to explain the organizational structure of staffing and the hierarchy within education so that the researcher could adjust the data set.

Another example from this RPP is when the researcher suggested using a Survival Analysis Model to visualize teacher attrition data. This was a model unknown to the practitioner so an extensive list of vocabulary and mathematical computations were shared to allow a better understanding of why this model would benefit this study. The sharing of language helped create trust between the practitioner and researcher that this model would be useful to answer the research questions.

In a learning environment where the two most important people were both student learners, acceptance of the pace and learning each other's perspective of subject matters was important. Language collaboration was necessary to begin the RPP, but then was required throughout during times of confusion or when new ideas emerged. In this RPP, it is the focus of communication with plain language which most fostered trust in the team and confidence in the process.

Explore and Clean the Data.
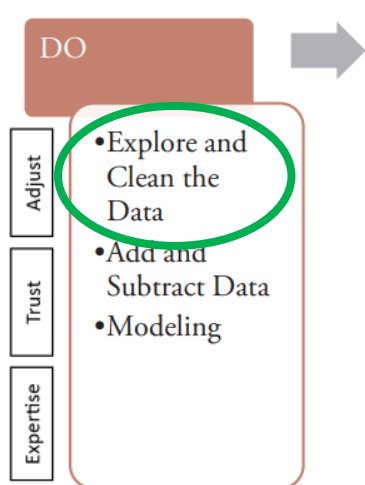
The next step was to explore and clean the data using teacher movement data provided by the Nebraska Department of Education to uncover patterns and any phenomena regarding Nebraska teachers. The Ed.D. candidate provided guidance, direction, and areas of focus for the statistics students to retrieve data on. Most of this work was done by D. Sinha, as part of her Data Science master's Thesis, and by S. Malisetty, who was a student worker hired by the Mathematics Department to assist in the research. Much of the team's collaboration was spent on exploring and cleaning the data.

Identify Variables. This analysis started with a few preliminary questions based on national trends and data collected in other states. These trends helped determine which teacher demographics and school characteristics to consider. Some *teacher* demographics that the study considered were gender, ethnicity, age, experience, teaching assignment, education, and residence. This is not an exhaustive list, and throughout the process, other characteristics were explored as they became relevant.

It was important to trust the expertise of the statisticians when looking at the data sets. They were able to help best determine appropriate ranges and number types that would be computable. These adjustments would allow for better pattern recognition and understanding of the data. For example, it needed to be determined what will be considered "one" teacher within the study. As data is reported, there will be statements that reference a specific number of teachers, it is important to be clear on whether "one" teacher was one individual or could be the combination of two part-time individuals. It would also be possible to record a part-time teacher as a decimal to represent their time in the classroom. Therefore, a component of determining variables was also determining how some of the data would be numerically presented for statistical purposes.

Clean the Data. Large, longitudinal data sets are messy. This data set spanned several decades with over 100,000 staff members represented. Over that time, state reporting requirements were improved, and reporting standards updated. Thus, simply organizing the data itself was a large task. For example, specific job code roles became more specific in recent years. The team, therefore, needed to decide how job codes would be collapsed into consistent columns to include all decades of data. Another option could be to eliminate the overly general data from the early decades. The team chose to include

all data and the process of determining position codes will be described in the next chapter.

Another example of the messiness of longitudinal data is the changing of definitions and social norms over time. For instance, in the earlier years of the NDE data set, there were only five ethnicity categories. In 2010, the data set changed and allowed staff to identify within one of eight ethnic categories. This change was due to social norms changing around how individuals could identify ethnically. Not only can social norms impact longitudinal data, but so can law. An example of this that did not impact this data set but could impact future research is gender. Traditionally, individuals would list their gender without any requirements, allowing them to list how they identify. In, 2023 in Nebraska, an Executive Order was signed by the Governor requiring state employees to report their gender assigned at birth (Bamer, 2023). This order could change the outcome of the data since individuals could have different gender categories within the same data set over time.

In this RPP, the initial data cleansing took place along with data visualization and analysis. Due to the large amount of data available within the NDE file, researchers narrowed the focus to cleansing a few specific columns of the data, including position code, gender, and ethnicity.

In the Summer of 2022, the Research Policy Lab partnered with students in the University of Nebraska-Omaha Statistics Department. The purpose was to begin a collaborative research process based on an Exploratory Data Analysis (EDA) model to explore the data provided by NDE. NDE granted access to student information, staff information, student performance, and student courses. The staff information provided by

the NDE was the primary focus for this research. This research was not a true EDA, but the EDA process heavily influenced the approach to research used in this RPP. (Explanation of the EDA process and how that process could possibly impact this research can be found in Chapter 5.)

Collaboration between statisticians and educators began by exploring the questions presented by the Research Policy Lab and comparing those questions to the data made available by NDE. The specific variables available were critical to determining where the team would start with the data analysis process. The goal was to explore many different relationships and topics within the data set, but after gaining a better understanding of the database and its limitations, the expected outcomes were adjusted.

Initially, the team wanted to compare the teacher characteristics to student characteristics and run analyses on correlations between which teacher groups were leaving or migrating from certain schools based on the school characteristics. However, the data provided by NDE was not cleaned to the level that was expected and the team had to spend an extensive amount of time cleaning the data before the comparisons and analysis could take place.

Since the student data set was significantly larger than the employee data set, it was determined that the focus would be placed on the employee data set. This would allow the team to focus on specific questions and teacher/staff characteristics, creating data cleansing procedures that could eventually be able to be applied to the student data set. The student data set had hundreds of thousands of students in the data set over more than twenty years. The employee data set had just over 100,000 staff members to

consider over a forty-year period. The team set to explore the employee data set as it was more time efficient to cleanse and analyze compared to the student data set.

Add and Subtract Data.

Like the job code example, when data was found to be duplicated, missing, or null, the team collaboratively determined how to address the issue. The researchers made decisions to either omit data from the analysis or to further examine the nuances of the irregularities, depending on the context of the data. When considering outliers, similar decisions were made as to whether the data should be omitted or if further examinations should be conducted to determine if the data is accurate. If the outlier was accurate, it remained within the data set. If the outlier proved to be a miscalculation or a result of an inconsistent data collection, it was omitted from the data set.

Other data manipulation can include generating consistent scales, converting text to numbers, converting continuous data to categorical data, combining variables, and generating groupings as suggested by Myatt et al. (2014). Many of these decisions required discussions with district data stewards to understand the data collection process of districts along with discussions with the statisticians. Throughout this process, concise notes were recorded so that the process could be documented within the final report.
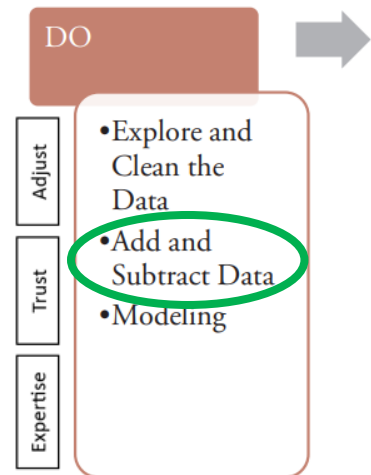
Modeling.
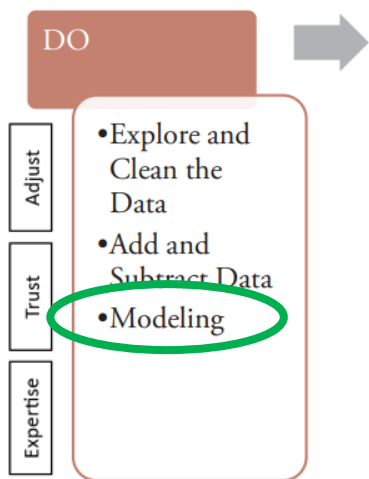
Once data was calculated and organized, the next step was to find correlations and patterns within the data. This was done using a variety of strategies. The statisticians created visual representations of the data through charts, graphs, and diagrams so that informal analysis of the data could be completed. Based on what was uncovered through descriptive statistics and the analysis of tables and visual representations, the statisticians conducted data regression analysis to identify valid interpretation in the data. Data was also divided into subsets or filtered to check correlations between variables as suggested by Myatt et al. (2014).

Up to this point, the data being considered was focused on quantities of the entire data set and average years worked of various groups within the data set. The RPP next focused on how characteristics of staff related to the probability that an individual would be retained from year to year. The statistics team suggested considering a Survivor Analysis Model to represent retention probability. The concept of using a Survival Analysis to explain this data appeared to the researchers to be a novel approach. Within chapter two multiple examples of studies were given where teacher attrition and retention had been studied throughout the country and in Nebraska. None of them used a Survival Analysis to determine retention probabilities. This method will provide another way to analyze teacher retention data and could potentially provide a meaningful contribution to the teacher retention discussion. Thus, a Survivor Analysis was completed to better understand the staff's probability of exit from Nebraska Public Schools.

A Survival Analysis is "where the outcome variable of interest is time until an event occurs" (Clark et al., 2003). The Survivor Analysis provides the probability that an individual survives from the time of origin to some point later. It is used to analyze "the time until an event occurs. For example, time-to-event occurrence of teacher turnover" (Sinha, 2022, p. 22). There are multiple methods of Survivor Analysis, including Kaplan-Meier, Cox Proportional Hazard, Weibull, Exponential, and Accelerated Failure Time. The statisticians also utilized a Hazard Function, which is a way to help model data within a Survival Analysis. In this case the Hazard Function would model a teacher's probability of exiting the data set based on their characteristics.

This research examines teacher demographic characteristics such as gender and ethnicity with respect to the length of service time. A statistical analysis modeled the relationship between the dependent variable (length of service time) and the independent variables (ethnicity, gender, etc.). As mentioned, a variety of statistical operations were utilized, with an emphasis on the Survival Model to help capture information about teacher and staff retention. Sophisticated modeling, such as Survival Model, is outside of the principal and Educational Leadership faculty's skill set. This novel contribution of Survival Model would only be possible through the RPP and collective expertise.

Share

The final stage in the Prepare-Do-Share Framework (figure 5) is share the conclusions, results, and perform a meta review. In traditional dissertations, this occurs in chapters 4 and 5. In this dissertation, chapter 4 summarizes the full teacher attrition and

SHARE

Adjust

- Conclusions
- Share Results
- Meta Review

Trust

Expertise
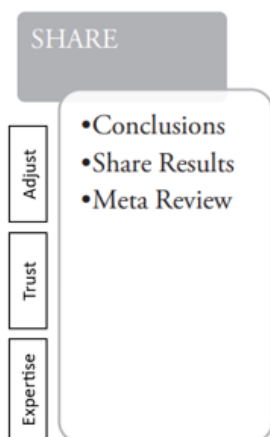
retention conclusions and provides recommendations for future studies on the topic of teacher attrition. Finally, chapter five provides recommendations for future Research-Practice Partnerships in the NEPRL context.

Results of Research-Practice Partnership

The above results demonstrated a Research-Practice Partnership process and its implications on the conversation around teacher attrition and retention in Nebraska. The purpose of this study was to highlight a RPP and showcase its strengths as a way to conduct research.

Throughout the process, the partnership proved to have more advantages than disadvantages. There were countless examples of data analysis, calculations, and mathematical modeling that took place that would have taken hours upon hours for the practitioner to learn and become proficient enough to produce the results shown. As a practitioner, having the research partnership was critical to providing reliable and viable data analysis and results.

There were also countless examples of decisions that needed to be made by the practitioner because of the researcher's lack of understanding of the data set and educational setting. One simple example of this would be the simplification of the position codes. The researcher would not have had the knowledge of the more than 50 different codes to understand how to categorize them and give them a simplicity that will be accessible to policy makers. This type of collaboration took place throughout the data cleansing process.

Another important aspect of the RPP was the interpretation of the results. The mathematical calculations and reports created by the statistician were thorough and reliable but had no context. The practitioner was better equipped to put context to the results and demonstrate how the results could be used to further research and understand the best way for them to impact educational policy.

Chapter 4

Nebraska Teacher Attrition Results

This chapter presents the specific results of the Research Practice Partnership study which investigated the Nebraska teacher attrition patterns over many years.

Statement of the Problem

At the time of this dissertation, significant attention has been drawn to teacher shortage and what is called the Teacher Pipeline. Typing "Teacher Shortage" into an internet search engine quickly provides hundreds of articles written in the last year on the topic. The headlines read: "Wisconsin Teacher Shortages, Recruitment Efforts Doubled" (Van Zelst, August 31, 2023), "Are Pay Raises Helping to Address Kentucky Teacher Shortage?" (Ford, September 2nd, 2023), and "From 'Crisis' to 'Catastrophe,' Schools Scramble Once Again to Find Teachers" (Pettypiece, August 13, 2023).

States around the country are reporting historically high teacher attrition rates. Pennsylvania lost 7.7% of its teachers in 2023, that was the largest teacher exodus in history for the state (Fuller, 2023). The state of Washington had a teacher attrition rate of 8.91%, which was the highest rate in 37 years (Goldhaber & Theobald, 2023). All while the number of students graduating with education degrees has continued to decrease over the last 50 years (Institute of Education Sciences, n.d.).

Teacher shortages are a nationwide issue that are partially caused by high rates of teacher attrition. The topic needs to be researched and addressed so that solutions can be found. Utilizing a local Research Practice Partnership (RPP), this study investigates patterns of teacher attrition and retention in Nebraska from the 1980s through the 2020s.

Purpose of Study

Patterns of Nebraska teacher attrition and retention over several decades will help inform state and systems-level response to areas of need with possible policy implications to address the Nebraska Teacher Pipeline.

Research Questions

Specifically, this study is motivated by two central questions:

1. What are the mobility and attrition trends of certificated Nebraska public school employees from 1982 to 2021?

2. Do these trends vary by role and demographics?

Operational Definitions

White – A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

Black or African American – A person having origins in any of the Black racial groups of Africa.

American Indian or Alaska Native – A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment.

Asian – A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

Native Hawaiian or Other Pacific Islander – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands (United States Census Bureau, 2022).

Exit Year – The last year that an individual exists in the longitudinal data set with their absence being true for three consecutive years. If the individual returned to the data set in less than three years, then this was not deemed their Exit Year.

Gender – Within this study staff members were categorized in three ways: Male, Female, or Unknown. How this information was acquired from staff is not known. The gender labels could be based on sex (biological) or on self-identification. The researchers are unaware of how the data was collected.

Research Team

The research team included graduate statistic students, statistic faculty member, educational leadership graduate student, and educational leadership faculty member. The educational leadership student worked primarily with statistics students D. Sinha and S. Malisetty. The tables and figures in this chapter reflect the completion of Sinha's (2022) research.

Data Set

The Nebraska Department of Education regularly collects student, teacher, and district data for all public-school districts in the state. The data collected is used by NDE in a variety of ways including evaluation and program improvement. Through a collaborative agreement, NDE has provided de-identified data to the Nebraska Education Policy Research Lab (NEPRL) for the purpose of student-driven investigations aligned with existing problems of practice, evaluations, and program improvement reviews supported by NDE.

The data set used for this investigation of the Nebraska Teacher Pipeline was limited to certificated public school employees in settings of grades

kindergarten through grade 12 from 1982 to 2021. The data set contains information for over 100,000 certificated public-school employees.

Security

NDE utilized their Microsoft Azure cloud for secure NEPRL access to NDE data. Azure access is monitored by NDE, requires a log in, is limited to access only (no downloads), and tracks all access and activities per user. NDE Azure access was provided to the statistic graduate students and statistics faculty member. At the time of this dissertation, educational leadership students and faculty did not have access to a user-friendly, data analytics tool which would be compatible with Microsoft Azure in the current cloud format. All members of the NEPRL team completed FERPA training and signed data agreements outlining the security expectations of all data. and schools will continue to upload their data to that system regularly through monthly and annual data submission cycles from each district.

Data Cleaning

The employee data set had the following categorical information for each employee: *NDE STAFF ID, DataYears, SchoolID, SchoolName, DistrictID, DistrictName, Ethnicity, Gender, Full Time Employee (FTE), EducationalAttainment, TotalExperience, MasterDegree, ExperienceInSystem, Position, SPI, SubjectArea, CertType and CertType.1.* It is possible, and likely, that each of these codes could provide information on retention and migration patterns. To complete this research within a reasonable amount of time, only some of the categories were considered for this research. Others will have to be left for further researchers. The categories and accompanying descriptions that are used in this research are found in Table 2.

Table 2

Staff Data Columns Provided by NDE (Sinha, 2022)

Data Column	Description
NDE_STAFF_ID	Unique staff ID
DataYears	Year of service
Ethnicity	Ethnicity of staff
Gender	Gender of staff
TotalExperience	Length of service time of staff
MasterDegree	Information of staff bearing masters degree
EducationalAttainment	Educational qualification of staff
Position	Staff's job position
Position_Codes	Staff's job position's code

SchoolID, SchoolName, DistrictID, and DistrictName were not considered for this research so that the focus could be on state-level results for Nebraska educators rather than on specific schools.

Rather than using the data associated with the variables "Experience" or "Total Experience," the presence of the teacher's ID within the data sets were used to determine whether they were active. Due to difficulties in interpreting the data that was available, the variables ExperienceInSystem and TotalExperience will not be considered for this data analysis.

Full Time Employee (FTE) will still be used in the analyses but will not be considered in predicting an individual's likelihood to migrate or leave the profession within this research. Explained later in the research decision-making, the FTE will only be utilized to filter the data set and determine which employees will be considered within this research project.

Within the data set, there are 54 unique "Positions." To better analyze the data and aid in interpretation, especially for the analysis of Teachers, a new category was created

called "Position_Codes." This category was added to the data set to give more broad labels to the 54 unique position codes that exist. To gain a better understanding of the actions of teachers, it is important to view all of their data together as a single group. The six labels that were created were: Teacher, Counselor, Administrator, Specialist, Support Staff, and Teacher Leader. The original Position category was retained in the data because it is assumed that future researchers will be able to build off the findings in this research and uncover more patterns within the position codes.

This research is going to have specific focus on the Teacher label (one of the six new categories within the Position_Code variable), which is why it was important to separate those positions from the rest of the employee data. The titles included in the Teacher label are the following: Head Teacher, Department Head, Sp.Ed. Teacher, Collaborating/Co-teaching, Sp.Ed. Teaching Core Subjects/ALTSTDS, Sp. Ed. Teaching Core Subjects/Grading, Teacher, Teacher of Deaf or Hard Hearing, Teacher of Visually Impaired, Teacher-Collaborator, Teacher-Facilitator, Librarian, Media Specialist.

Within the Position column, there 3470 labeled as "Unknown." Due to the large number of individuals with this label, these individuals will still be considered within this research but will not be considered for any data distributions or graphs that consider Position or Position Code.

Table 3

Descriptions of Position Codes

Position Code	Description
Teacher	Staff whose main role is providing student instruction either in a classroom or in a small group/individual setting
Counselor	Staff whose main role is to be an academic or social-emotional guidance counselor

Administrator	Staff whose main role is school administration, both at the building level and district level
Specialist	Staff whose main role requires a specialized degree to work with students that is not a degree in education
Support Staff	Staff who are not certified in education or other specialized degree
Teacher Leader	Staff who are certified in education but whose main role is not instruction, but could be staff development or working with student behavior

Once the structure of the data had been established, the next step was to cleanse the data and check for any missing data, duplications, errors, etc. The cleansing process began with a focus on one staff category: gender. This category had binary data, either male or female, so it was thought to have the least barriers for gathering retention data. Once the cleansing of the gender category was complete, the goal was to replicate that data coding process with other categories.

The category did include some "Unknown" genders, suggesting that NDE did not have that individual's gender data. The reason for not having the data is not known to the researchers and any reasoning for the missing data would be speculation. The "Unknown" group makes up 0.06% of the staff population. For this analysis, the "Unknown" gender group is removed from all calculations because it was determined that this number would not have significant impacts on the overall data set since there are 100,000 subjects being considered.

To determine how gender impacted teacher attrition, it was necessary to determine what would be considered an "Exit" from the data set. There are examples of staff exiting and then not returning, while there are also examples of staff exiting but then returning to the data in a later year. Examples of why this would occur could be a teacher that takes five years off to stay at home with young children or someone who moves out of the state

only to return later. It was established that a staff member's "Exit Year" would be considered their last year of existing in the data set. For our purposes, any teacher that returned to the data set within three years of their "Exit Year" would not be considered an "Exit." Staff that remained in the data set from year to year or did not have more than a three-year absence in the data were considered retained.

Within the data set exists full- and part-time staff. Decisions had to be made on whether part-time staff would be considered in this data and what those boundaries would be. It was decided that staff who were more than half-time would be considered in this study. Staff have a numerical value between 0 and 1 in the column FTE, Full-Time Employee. Since the purpose of this research is to eventually focus on Teacher data rather than all Department of Education employees, any staff with an FTE value of less than or equal to 0.5 were not considered. Gathering data on part-time employees and teachers is important, but it was not the purpose of this work. The focus is on individuals that spend the majority of their time providing instruction to students.

When staff who were 0.5 FTE were excluded, this also excluded staff that work in two buildings an equal amount of time. The data set has separate entries for staff members that work in multiple buildings, meaning the individual shows up on two individual rows of data since they hold two separate positions. To eliminate duplicate staff entries and not count them twice, these individuals were removed from the data set. The number of individuals that had to be removed due to this rule was statistically insignificant relative to the overall data. A suggestion for future researchers is to examine the group of individuals that work at multiple buildings, as understanding this group's retention data could be of importance for other studies.

When cleansing was completed thoroughly, summaries of the Gender category were generated. The tables that were created show the total number of male and female staff combined from 1982 to 2021. Sorting on the two Position_Codes of Teachers and Administrators, Table 4 provides the number and percent of Teachers and Administrators by Gender.

Table 4

Nebraska Teachers & Administrators Counts by Gender, 1982 - 2021

Teacher			Administrator		
Gender	Count	Percent	Gender	Count	Percent
Female	60,531	73.67	Female	2,906	39.65
Male	21,824	26.30	Male	4,422	60.33
Unknown	48	0.03	Unknown	1	0.01

Females make up 73.67% of all teachers in Nebraska's Public Education in the time frame of 1982 to 2021. Females make up 39.65% of Administrators in that same time frame. This is a large discrepancy between the female to male ratio among teachers compared to the ratio of female to male among administrators. The female to male ratio among teachers is nearly 3 to 1. It is almost the opposite, a 2 to 3 ratio of female to male for administrators. This is a topic to explore in further research regarding why this large discrepancy exists.

With the Gender data cleansed to a satisfactory level where a data analysis could be completed and tables formulated, the next step was to select a second Staff demographic category and repeat the cleansing process. This process went more quickly since some of the major cleansing steps were completed, such as eliminating duplicate entries and determining how to count individuals.

The second Staff demographic, Ethnicity Category, was cleansed and analyzed. The first inconsistency to be addressed was how ethnicities were labeled in this span of nearly 40 years. From 1982 to 2010, Ethnicity was represented with numerical coding. After 2010, the category names were explicitly stated in the data set and additional categories were added. From 1982 to 2010, the following categories existed:

- 0 and 3 stands for White

- 1 stands for Native American

- 2 stands for Pacific Islander

- 4 stands for Black

- 5 stands for Hispanic

These five categories were then relabeled from numerical values to the updated Ethnicity Labels and combined with the categories that existed in the data after 2010, which are: White, Hispanic, Black, Native American, Asian, Pacific Islander, Multiple Categories, and Races Unknown. According to the National Center of Education Statistics, the categories used after 2010 are more in line with the recommendations made by the Federal Government in 1997 to include Asian, Multi-race, and Unknown Race. Due to NDE's change in how they collected data on Ethnicity, there are no staff members with the label of Asian, Multiple Categories, or Race Unknown before 2010. Table 5 shows the count of all NDE employees from 1982 to 2021 based on Ethnicity.

Table 5

Nebraska Department of Education Employees by Ethnicity,1982 to 2021

Ethnicity	Count	Percent
White	105,251	92.42
Hispanic	4,105	3.55
Black	2,451	2.15
Native American	639	0.56
Asian	470	0.41
Pacific Islander	391	0.34
Multiple Categories	465	0.40
Races Unknown	160	0.14

Since the change in Ethnic labels was introduced in 2010, and possibly some other unknown scenarios, some individual employees had different ethnicity categorizations from one year to another. To create consistency for those individuals, the most recent Ethnic Categorization was used to resolve duplication of individuals in the data.

The category of Unknown Ethnicity will not be considered in this research due to its small numerical value and lack of impact on the overall data set. However, the individuals and the Unknown label will not be removed from the data set so that other researchers may investigate it further in the future.

Relationships & Patterns

With two staff demographic categories having data that had been cleansed to a reasonable level, it was time to manipulate and analyze the data to see how these

categories impacted teacher retention. The first visual representations of the data were also created.

The graph examined was the Total Experience of staff from 1982 to 2021. "Total Experience" being based on how many years the unique StaffID showed up in the data set, essentially counting each year the staff member was a part of Nebraska Public Schools. This was used rather than the categorical column "TotalExperience." Using the number of years the Staff Member was present in the data seemed to be a more reliable way to count years of experience. It was observed that the Total Experience of all staff was gradually increasing from year to year, on average, until 2015. After 2015, the graph started to show a decrease in average Total Experience. (The graph being discussed in this paragraph is not able to be shown due to limitations of the RPP. The researcher/statistician had access to the data and these formative images, while the practitioner did not. At the time that this graph was generated, it did not seem consequential to the process to have it saved. Since then, the graph has been deleted. In retrospect, it would have been useful to have this graph available to show the progression of thought throughout this process.)

The next formative image created (also not shown for reasons given above) was the average Total Experience based on gender. The data included the Unknown gender category. The Unknown Gender category did not provide a significant data visual and since it was less than 0.1% of the data, it was determined that this category would be excluded from further analysis. The resulting image can be seen in Figure 6.

There was also an image created (also not shown for reasons given above) of staff's average Total Experience in their resignation year. This graph showed a significant

average decline of Total Experience of an average of nearly seven years in the year 2020, which coincides with the COVID-19 pandemic where the landscape of education took a major shift. This graph was not included in the results because having this information for all staff was not in line with the goal of this research. The decision was made to revisit this data with the Position Codes separated out. For the purpose of this research and the desire to understand Teacher-specific information, the data is not as effective when viewing all staff together at the same time. It is still important to consider this information for all public school employees, just not for this specific research.

After reviewing some of this preliminary data analysis and visualization, the question was posed within the research group of whether the data could include or did include staff that left the profession and then returned, looking at whether this data is continuous or not. This would have to be reconciled at another time because the time commitment required to do data tracking on returners was too much for this project. This project would rely on the rules that individuals were either retained from one year to the next or resign, with the rule established that if they returned to the data within three years, it would not be considered a resignation and if they vacate the data for more than three years, they were considered a resignation, even if they returned later. The group that leaves the data set for a period of time and returns would not be examined separately as its own subset.

Results

Figures 6 through 17 along with Tables 6 and 7 and their coinciding data are the

results from the published thesis *Identifying Factors of Teacher Attrition in Nebraska: A*

Survival Model Approach by D. Sinha. Sinha used the data and collaboration within this

RPP to complete graduate level coursework and requirements to graduate with a master's

degree from the University of Nebraska-Omaha. Since, the thesis was a result of the

collaboration done within this RPP, the results of Sinha's thesis will also be used here as

the reporting results for this RPP.

Gender and Ethnicity Results

Figure 6

Teacher Years of Experience by Gender
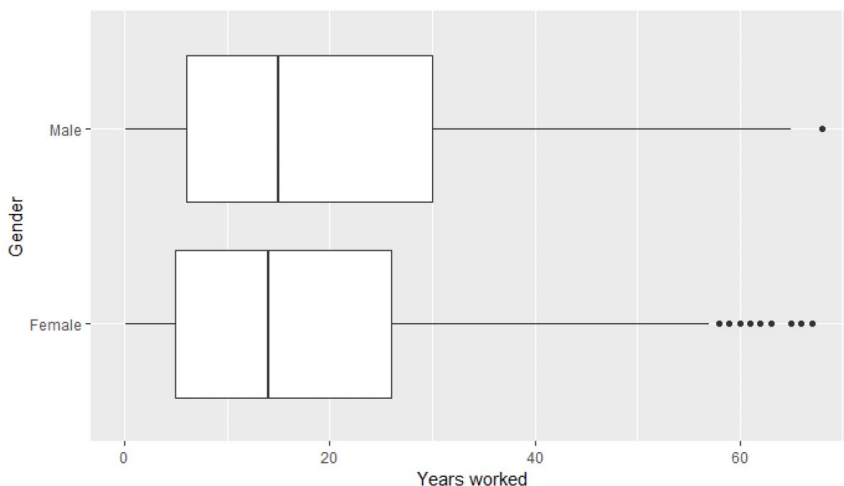
(Sinha, 2022)

Figure 6 shows that male and female teachers, on average, have the same years of

experience. Both have an average of 14 years of experience. It is also observed that the

male teachers have a distribution that is slightly right skewed. This indicates that the

majority of the male teachers have less experience compared to the average value.

Table 5 displays the breakdown of NDE employees by ethnicity and Table 6

shows the breakdown of the Teacher Position code by ethnicity. We see that 93% of all

employees were White, while almost 96% of teachers are White. The other ethnicities

make up 4.1% of teachers in Nebraska, with Hispanic being the most prevalent at 1.77%,

or 1880 teachers, from 1982 to 2021.

Table 6

Nebraska Department of Education Teachers by Ethnicity, 1982 to 2021

Ethnicity	Count	Percent
White	78896	95.90
Hispanic	1880	1.77
Black	1182	1.38
Pacific Islander	305	0.26
Native American	318	0.29
Asian	230	0.13
Multiple Categories	271	0.18
Races Unknown	97	0.08

Figure 7

*Teacher Years of Experience by Ethnicity*
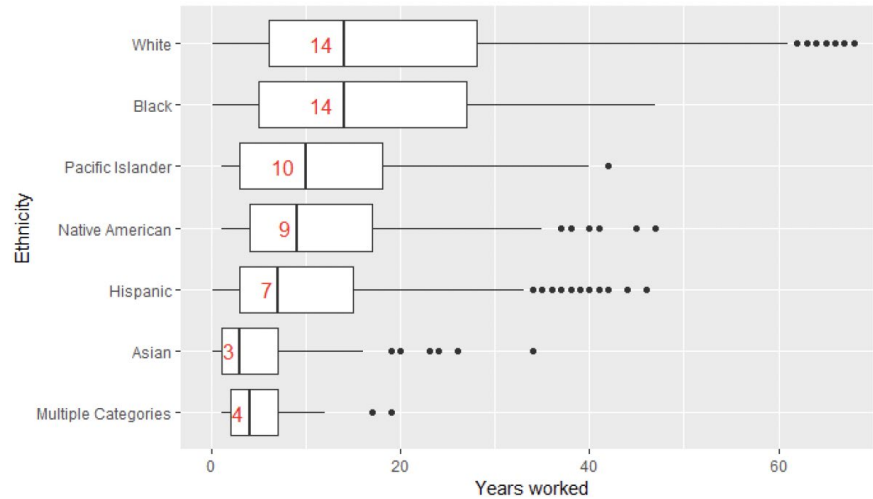
(Sinha, 2022)

Figure 7 shows the average years worked for teachers by ethnicity. White and Black teachers both average 14 years of work, which was consistent for both male and female teachers as shown in Figure 6. All other ethnicities are well below that average, with Asian having the lowest average years worked at 3 years.

Years Worked by Position Results

Figure 8

Average Years Worked by Position Code
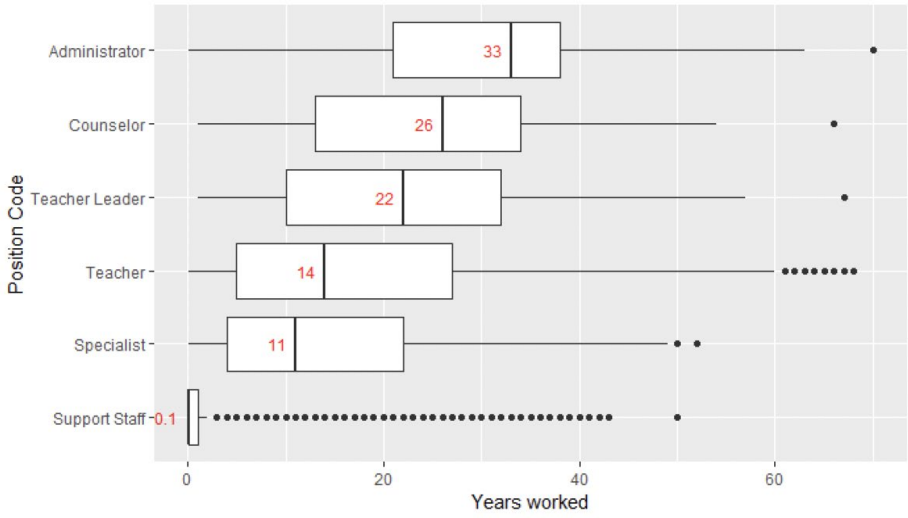
Figure 8 shows the Box and Whisker display of average years worked by position code of public school employees in Nebraska from 1982 to 2021. Administrators, Counselors, and Teacher Leaders all have higher average of years worked than teachers. This seems reasonable considering most administrators, counselors, and teacher leaders have the role of teacher before taking on those positions. Being a teacher is typically a prerequisite to being an Administrator, Counselor, or Teacher Leader.

Figure 9

Average Experience of Teachers for Stayers and Leavers
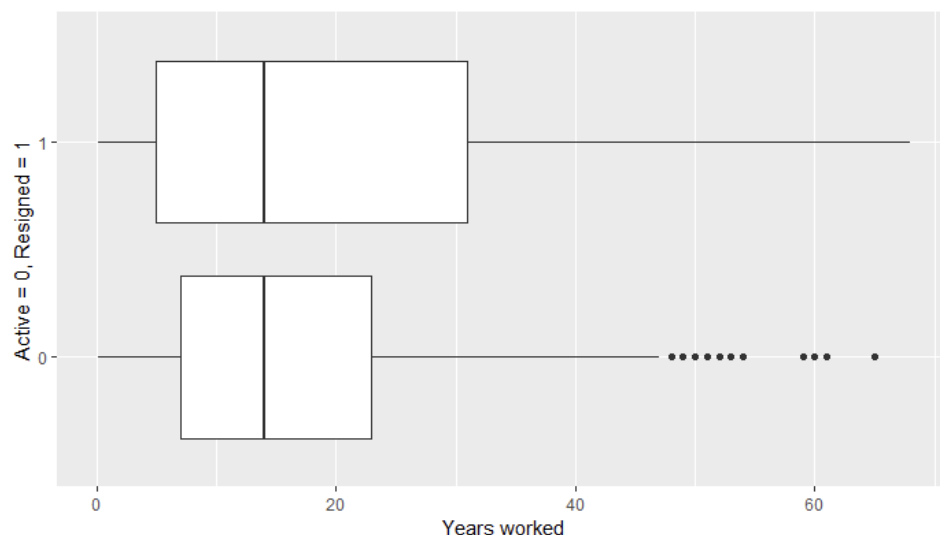
(Sinha, 2022)

Figure 9 shows that the median value of active teachers within the data set was 14 years. The median value of teachers that resigned from Nebraska Public Schools was the same at 14 years. Seeing that the Resigned Teachers graph is more right skewed, this indicates that the majority of those teachers have less experience compared to the median value.

This would be consistent with other research that teachers tend to leave the profession either in their early years or later in their career as they near retirement. Teachers in their first few years of teaching are much more likely to quit or transfer than their other teaching counterparts (Gulosino, C., Ni, Y., & Rorrer, A. K., 2019; Provasnik, S. & Dorfman, S., 2005). In 2003 Ingersoll, R and Smith, T. reported that 40-50% of teachers leave the profession within the first 5 years. Additionally, teachers in their later

years that are looking at retiring make up about 12% of the total teacher turnover
(Ingersoll, 2001a).

Figure 10 provides another visual of the number of Years Worked for those that
remain active and those that resign using a density chart. The density of those that remain
active is a steady decline. The density of those resigning sees two apexes within the data.
The first is an apex around 2-3 years worked. The other apex occurs around 33 years
worked.

This data is consistent with previous findings regarding many teachers leave the
profession within the first 5 years of teaching or remain in the career until retirement. The
highest resignation densities occur between years 1-3 (teachers who are just starting their
careers) and years 32-35 (teachers who have reached retirement age).

Figure 10

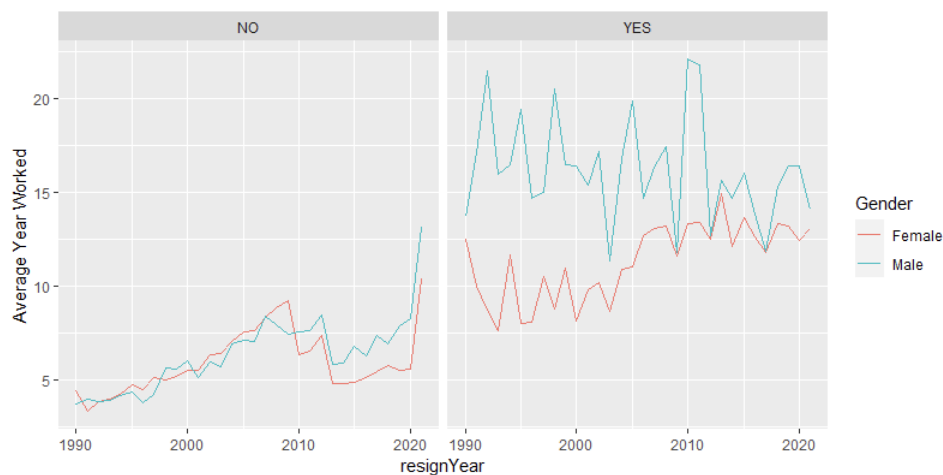*Density Graph Representing Active and Resigned Teachers' Behavior*
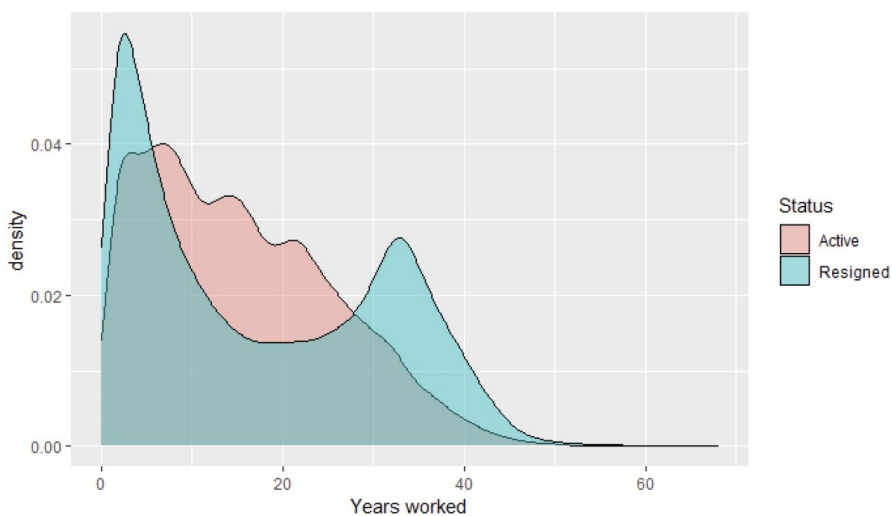
(Sinha, 2022)

Master's Degree Attainment against Year of Resignation Results

Figure 11

Average Years Worked Over Time Based on Gender and Master's Attainment

(Sinha, 2022)

Figure 11 is a visualization of this data over time rather than based on years worked. This shows how societal events might have impacted teacher retention and resignation. Looking at the group of teachers without a Master's Degree, there are interesting trends. From 1990 to 2008, the length of time a teacher worked before resigning was steadily increasing. The year 2008 was the start of major recession in the United States, which coincides here, with a rapid decrease in teacher Average Years Worked before resigning. In 2013, that average started to steadily increase again ending with a major spike in 2021. There are not the same patterns in the group of teachers who have attained a master's degree.

Survivor Model Approach

Up to this point, the data being considered was focused on quantities and average years worked while considering characteristics of all staff in the data. The Research Lab

next focused on how those characteristics related to the probability that an individual would be retained from year to year. The statistics team suggested considering a Survivor Analysis Model to represent retention probability. Thus, a Survivor Analysis was completed by using a teacher's or administrator's exit year as the basis of determining their exit from Nebraska Public Schools. This research examines teacher demographic characteristics such as gender and ethnicity with respect to the length of service time. A statistical analysis modeled the relationship between the dependent variable (length of service time) and the independent variables (ethnicity and gender). Within this line of problem solving, the question was posed: Is the probability of survival uniform from year to year for gender and ethnicity?

A Survival Analysis is "where the outcome variable of interest is time until an event occurs" (Clark et al., 2003). The Survivor Analysis provides the probability that an individual survives from the time of origin to some point later. It is used to analyze "the time until an event occurs. For example, time-to-event occurrence of teacher turnover" (Sinha, 2022, p. 22). There are multiple methods of Survivor Analysis, including Kaplan-Meier, Cox Proportional Hazard, Weibull, Exponential, and Accelerated Failure Time.

Survivor Analysis was used to help determine the probability of teachers, categorized based on certain demographics, returning the next school year. Figures 12, 13, and 14 show the Kaplan-Meier model being used to show differences by staff characteristics.

Figure 12

Kaplan-Meier Survival Curve Based on Position Code
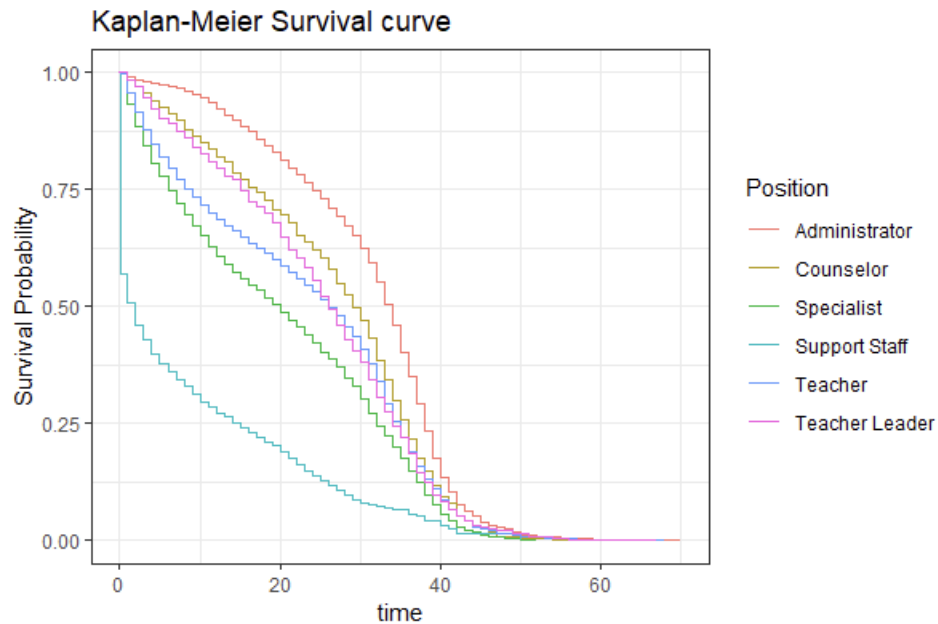
(Sinha, 2022)

Figure 12 displays the survival probability from one year to the next for each of the position codes. Administrators show the highest survival probability. Teachers fall somewhere in the middle, showing less probability of survival in earlier years compared to administrators, counselors, and teacher leaders before becoming more consistent with counselors and teacher leaders as more experience is gained. The slope changes of the teacher curve are consistent with previous observations about teachers in their early years and later years. The slope is much steeper in years 1-10 and 25-40 than it is in years 10-25, suggesting that once teachers have made it past the first few years of teaching, they are much more likely to stay in the career until retirement age.

Figure 13

Kaplan-Meier Survival Curve Based on Teacher Gender
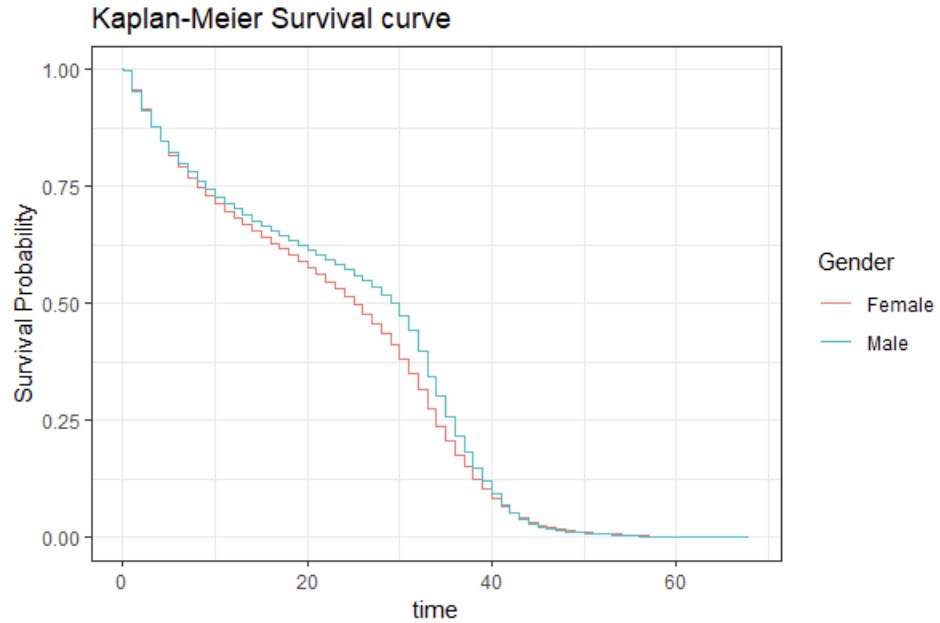
(Sinha, 2022)

Figure 13 provides a visual of the teacher survival probability data based on gender. The two curves see slope changes at around the same times, but males consistently have a higher probability of survival than females.
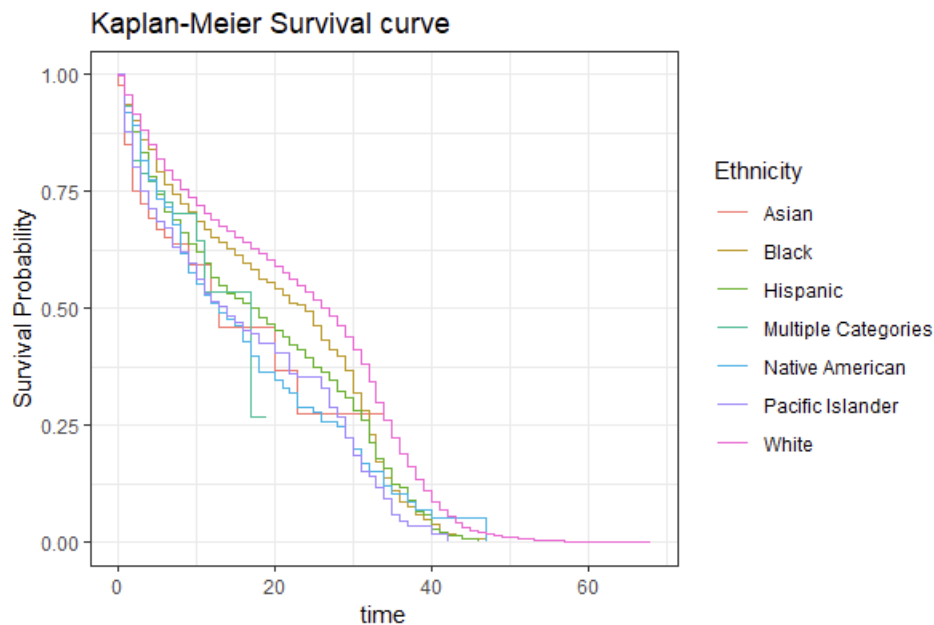
Figure 14

Kaplan-Meier Survival Curve Based on Ethnicity

(Sinha, 2022)

Figure 14 provides a visual of teacher survival probability data based on ethnicity. There appear to be irregularities within the data, this could be attributed to the inconsistent labeling of ethnicity within the data set. Again, most lines share similar curves. White teachers have the highest survival probability, followed by Black. After White and Black teachers, there are very similar survival probabilities from year to year for the other five ethnicities, although Asian teachers tend to have the lowest survival probability.

Results also suggested differences between male and female teachers' survival probability with males having a 50% survival probability and females having a 37.5% probability, indicating that male teachers have a higher survival probability when compared to female teachers. The survival probability of teachers with respect to ethnic

groups was also compared. White female teachers have the highest survival probability of 75% with an average of 10 years of experience. Similar results were found for Black and Hispanic female teachers.

Based on the research of Sinha (2022) the Weibull distribution was considered to be the best fit for the data used in this study. The Weibull distribution is commonly used in survival analysis (Cornell Statistical Consulting Unit, 2020). Sinha (2022) used the Weibull distribution to model the retention of staff and to identify the pattern of teachers staying in a teaching position or leaving the position. Table 7 provides the parameter estimates of the Weibull Survival Model with 95% confidence intervals (LCI, UCI) and their significance level for gender and ethnicity. White, Black and Hispanic are highly significant which suggests that they are comparatively stable in their teaching positions. Male is significant compared to female, suggesting that males have a higher probability of staying in their positions when compared to females.

Table 7

Parameter Estimates of the Weibull Survival Model with 95% Confidence Intervals (LCI, UCI)

Parameters (β^*)	Estimate	Std.Err	LCI	UCI	z	p-value	Signi
Intercept($\hat{\beta}_0^*$)	-107.551	0.795	-109.11	-105.99	-135.31	0.000	***
Ethnicity							
Asian	–	–	–	–	–	–	–
Black	0.638	0.090	0.46	0.81	7.05	0.000	***
Hispanic	0.616	0.090	0.44	0.79	6.86	0.000	***
Multiple Categories	0.265	0.141	-0.01	0.54	1.87	0.061	.
Native American	0.235	0.107	0.02	0.44	2.20	0.028	*
Pacific Islander	0.542	0.116	0.31	0.76	4.67	0.000	***
White	0.857	0.086	0.68	1.03	9.93	0.000	***
resignYear	0.055	0.000	0.05	0.06	139.34	0.000	***
Gender							
Female	–	–	–	–	–	–	–
Male	0.066	0.01	0.05	0.08	6.37	0.000	***
Position_Codes							
Administrator	–	–	–	–	–	–	–
Counselor	-0.287	0.042	-0.37	-0.20	-6.81	0.000	***
Specialist	-0.810	0.031	-0.87	-0.75	-25.99	0.000	***
Support Staff	-3.387	0.028	-3.44	-3.33	-118.95	0.000	***
Teacher	-0.633	0.025	-0.68	-0.58	-25.58	0.000	***
Teacher Leader	-0.271	0.042	-0.35	-0.19	-6.49	0.000	***
FTE	0.393	0.018	0.36	0.43	21.79	0.000	***
Log(scale)	0.107	0.003	0.10	0.11	35.28	0.000	***

Notes on p-value and significance
$*** = 0 < 0.001, ** = 0.001 < 0.01, * = 0.01 < 0.05, . = 0.01 < 0.1$

(Sinha, 2022)

Figure 15 shows that there is a significant decline in the Hazard Rate after five years of service for both male and female teachers. The Hazard Rate is a calculation used in a Survival Analysis to help model data, in this case the Hazard Function would model a teacher's chance of exiting the data set based on a characteristic (gender). Female White teachers have a slightly higher hazard rate compared to male White teachers, suggesting that the female teachers leave their teaching positions more quickly than males. These

results are based on white teachers, given that the proportion of White teachers is very high in the available data set (95.90%).

Figure 15

2018 Hazard Function for Nebraska White Teachers by Gender
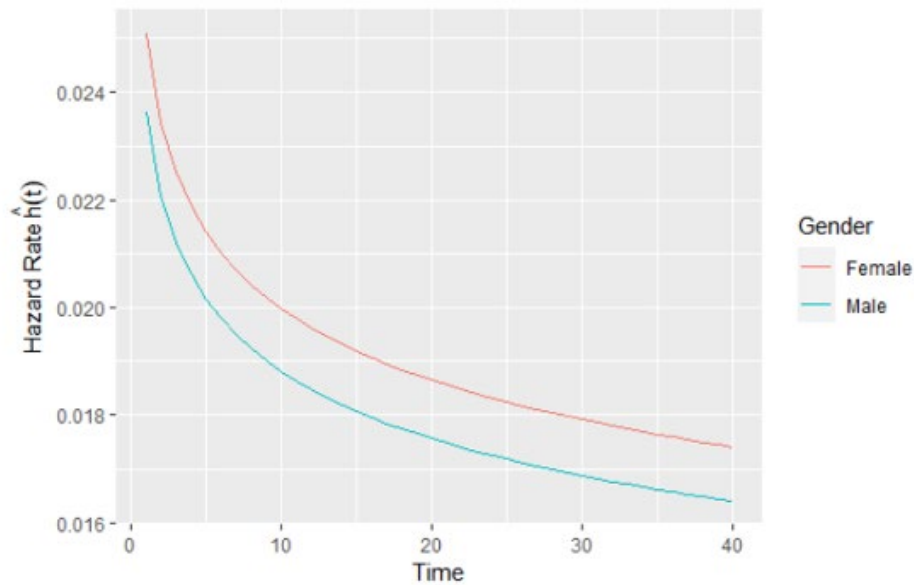
(Sinha, 2022)

Figure 15 indicates that female teachers are more likely to resign earlier than male teachers. In addition to the Hazard Rates, Figure 16 presents the survival probabilities for male and female teachers, illustrating that the survival probability for male teachers is higher than female teachers. Although the difference between the survival probabilities for male and female teachers is statistically significant, the survival probability is very similar between male and female teachers within the first five years of service. The gender difference increases as the length of service increases with males staying in their teaching positions longer than females.

Figure 16

Estimated Survival Probabilities by Gender.
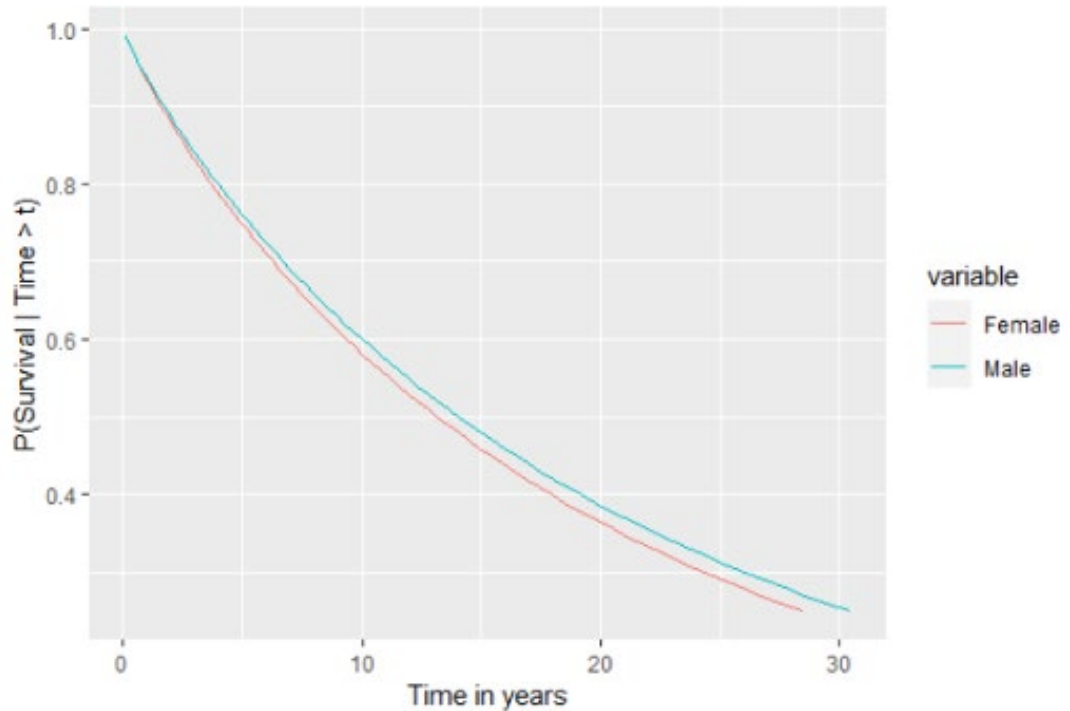
(Sinha, 2022)

The Survival Probability for male is significantly larger than female as observed from the

parameter estimates shown in Figure 16. In Figure 17 the estimated hazard function is

compared for the ethnic groups of female teachers working in Nebraska public schools

using 2018 records. Only female teachers are included because they comprise the

majority of the data (73.67%) available for this study. Overall, Asian female teachers

have the highest hazard rate and White female teachers have the lowest hazard rate. Black

and Hispanic female teachers have similar lower hazard rates but not as low as White

female teachers. Asian female teachers will leave the profession with less experience

compared to teachers from other ethnic groups. The functions also suggest that teachers

may remain in their positions for an extended period of time (10 years) if they are able to

pass the five-year milestone. The results suggest this is true for female teachers from all ethnic groups.

Figure 17

2018 Hazard Function for Nebraska Female Teachers by Ethnicities
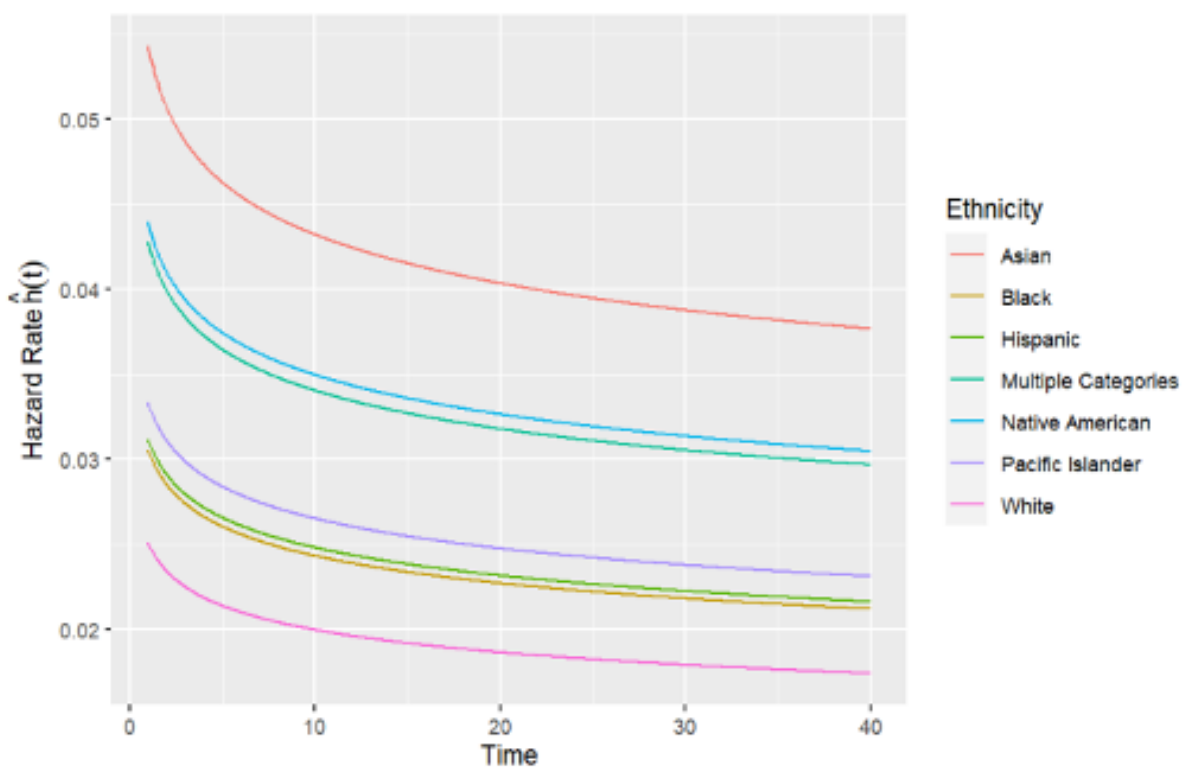
(Sinha, 2022)

Additional Results

After the completion of the Research-Practice Partnership, the Educational Research Lab was able to gain more access to the data set, which allowed for more data analysis to occur without the support of the statistician. In this portion of the research, the data set was available within Excel Spreadsheets and the practitioner was able to utilize a statistical program called Tableau to generate visual representation of the data.

This process was explored as another method to conduct research on the data set. Unfortunately, due to time and technology constraints, this method was only briefly explored, where there is much more than can be done with this data set and the Tableau program. This data set used with Tableau only goes back as far as 1994 because of technology constraints and the limited capabilities of Excel. The years 1982 to 1993 were available but were not able to be uploaded into Tableau. One limitation of this method is that some of the capabilities are limited due to the data process requirements needed for this size of a data set.

What is defined as a "Teacher" is the same as in the first phase of this research. It includes Head Teacher, Department Head, Sp.Ed. Teacher, Collaborating/Co-teaching, Sp.Ed. Teaching Core Subjects/ALTSTDS, Sp. Ed. Teaching Core Subjects/Grading, Teacher, Teacher of Deaf or Hard Hearing, Teacher of Visually Impaired, Teacher-Collaborator, Teacher-Facilitator, Librarian, Media Specialist. Additionally, this only represents staff that are considered 1 or less FTE (Full-Time Employee) but more than 0.5 FTE. Although the study of teachers who are less than half time would be important, the removal of this group helped limit duplicated individuals and this group was determined to be small enough that it did not have statistical significance on the data set.

It is noted that due to the size of the data set, there could have been omissions that were incidental and should have been included in the data set. On the same note, it is possible that there are individuals being counted in the data set that should have been omitted. The figures are based on data provided by NDE and then the filtering of the data that was done electronically. It has not been confirmed that the data set is entirely

accurate. However, due to the size, it was determined that if these errors exist, they will not have significant impact in the results of the data.

Below is a summary of some of the notable discoveries with Tableau:

Figure 18

Number of Nebraska Teachers (preK-12) by Year
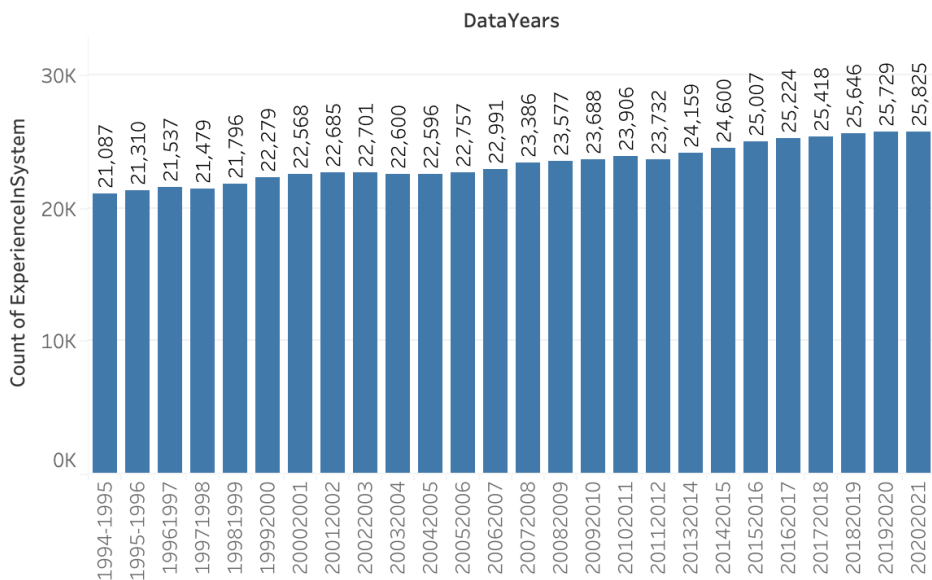
Figure 18 shows how many teachers existed in the data set by year from 1994 to 2021. Over time there has been a gradual increase in the number of teachers in the public schools in the state of Nebraska. From Fall of 2010 to Fall of 2021, the state saw an 8% increase in teachers being employed. Although this may seem like a promising statistic, the rise in student enrollment in that same period was 10% (NCES, 2023).

It is important to note that these figures are statewide. What is concerning is that as these student to teacher ratios increase, some districts are more heavily impacted than others. As schools that are deemed more difficult or are in rural areas lose teachers, it may be harder for them to replace those teachers. The concentration of continued student

enrollment growth without the same pace of teacher employment creates strains on the educational systems in those specific areas.

Figure 19

Average Experience of Nebraska Teachers (preK-12) by Year
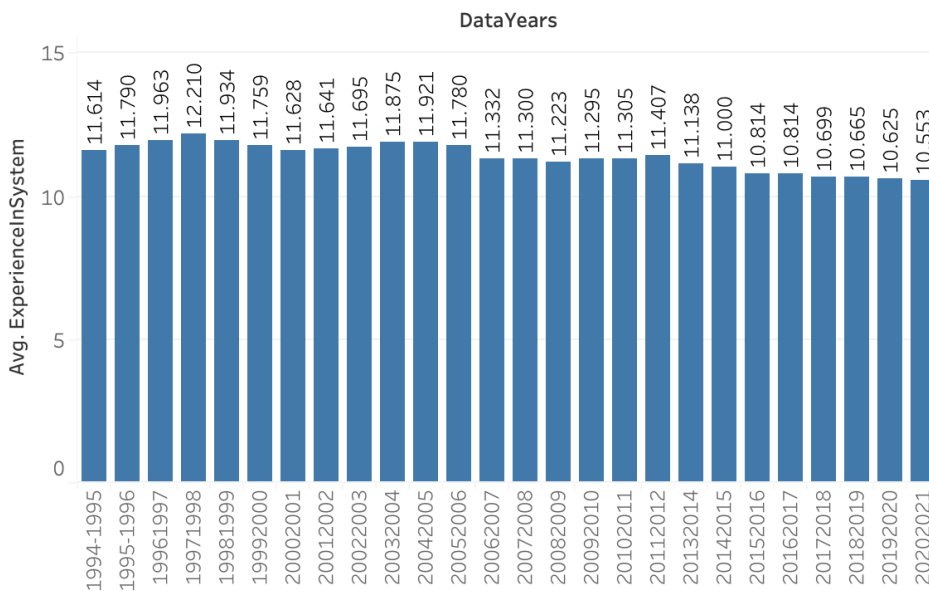
Figure 19 shows the average Years of Experience teaching in Nebraska Public Schools. With the exception of a few peaks, the average years of experience has steadily decreased from 1997 to 2021, where the average in 1997 was 12.2 years and the average in 2021 is 10.5 years. This would support the findings of other researchers that teachers are leaving the career earlier and earlier rather than waiting until retirement.

Figure 20

Number of Nebraska Teachers (preK-12) with and without Master's Degrees by Year
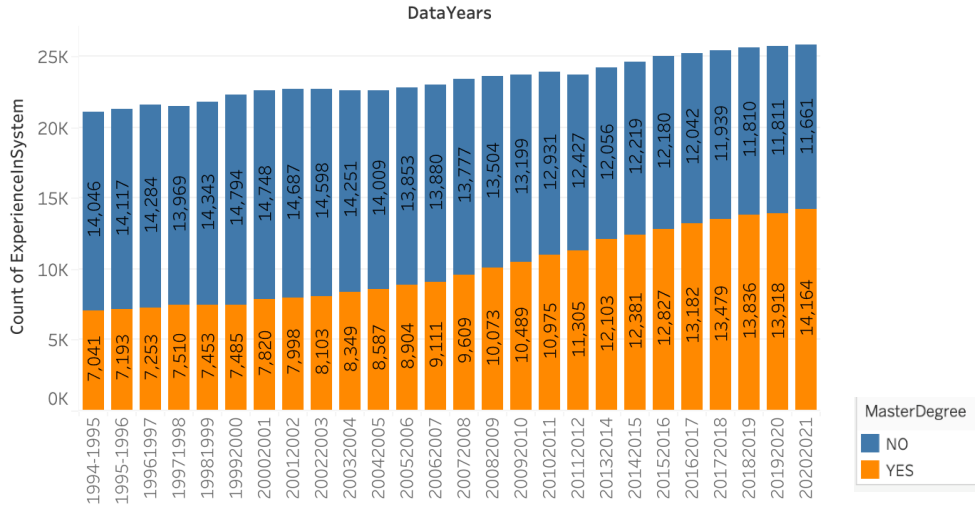
Figure 20 shows the number of teachers with and without Master's Degrees. In the 1994-1995 school year, Teachers without a master's outnumbered the teacher's with 2 to 1. In the 25+ years since, that ratio has changed. In the 2020-2021 school year, there were 3,000 more teachers with a master's than without.

Figure 21

Number of Nebraska Teachers (preK-12) by Year by Ethnicity
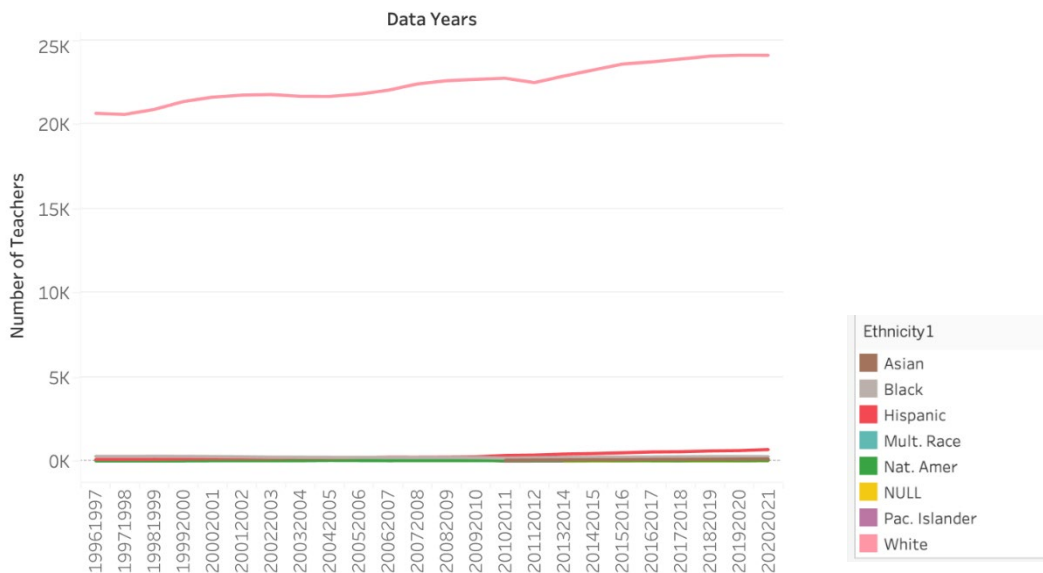
Figure 21 shows the count of teachers in Nebraska Public Schools separated by Ethnicity. It is obvious that the number of White teachers significantly out numbers the number of teachers of any other Ethnicity. Due to this, Figure 20 was made. Figure 20 shows the same data on a graph but with White teachers omitted so that the patterns of teachers of other Ethnicities can be visible.

Figure 22

Number of Nebraska Teachers (preK-12) by Year by Ethnicity (Excluding White)
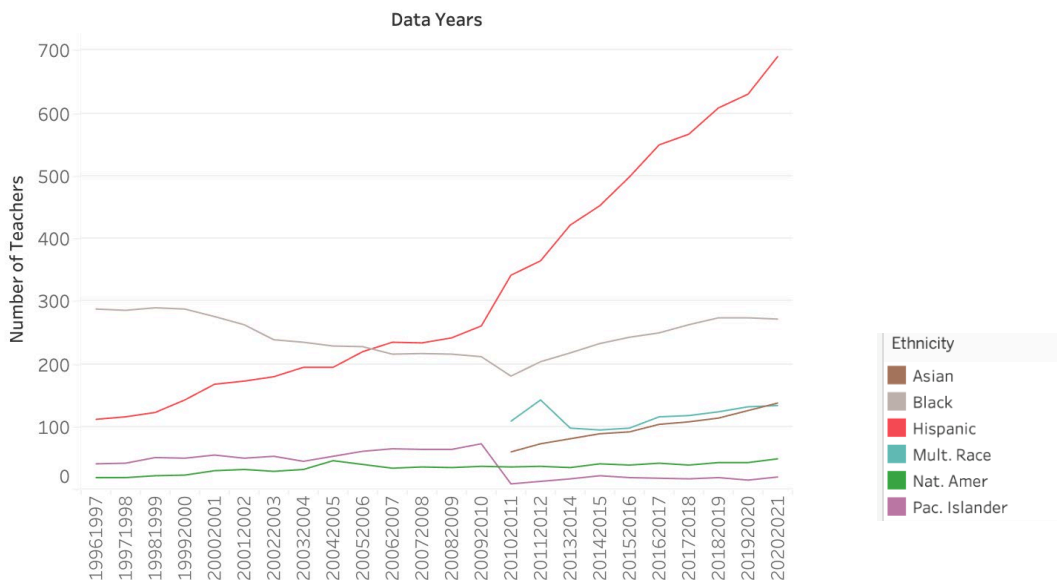
Figure 22 shows Multi-Race and Asian, two categories that were added in 2010.

Prior to that, Pacific Islander and Asian were categorized the same, which explains the

dip in Pacific Islander in 2010-2011. This would also explain the dip in Black teachers at

2010-2011 as some were more accurately represented by the Multi-Racial designation. It

is also noticed that the number of Hispanic teachers is increasing, and increasing at a rate

much faster than other ethnicities.

Figure 23

Average Years in Nebraska System Compared to Average years of Total Experience of

Nebraska Teachers (preK-12) by Ethnicity
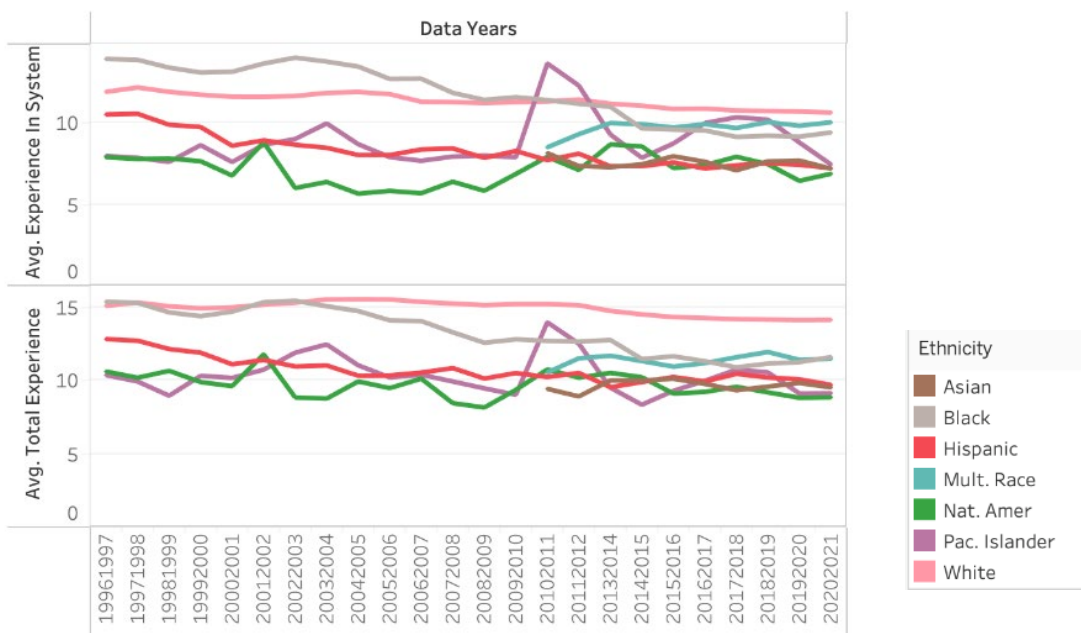
Figure 23 provides a comparison of teachers' average years in Nebraska Public

Schools and average years of teaching experience anywhere. This data shows all

ethnicities have somewhat similar average years in the Nebraska system, with all

categories falling between 6.8 years and 10.6 years. There is a larger discrepancy in

overall experience, from 8.8 to 14.1. This could possibly show that White teachers are

more likely to work in-state private or out-of-state public/private education systems

throughout their career than other ethnicities and should be explored further.

Figure 24

Average Years in Nebraska System compared to Average years of Total Experience of

Nebraska Teachers (preK-12) by Gender
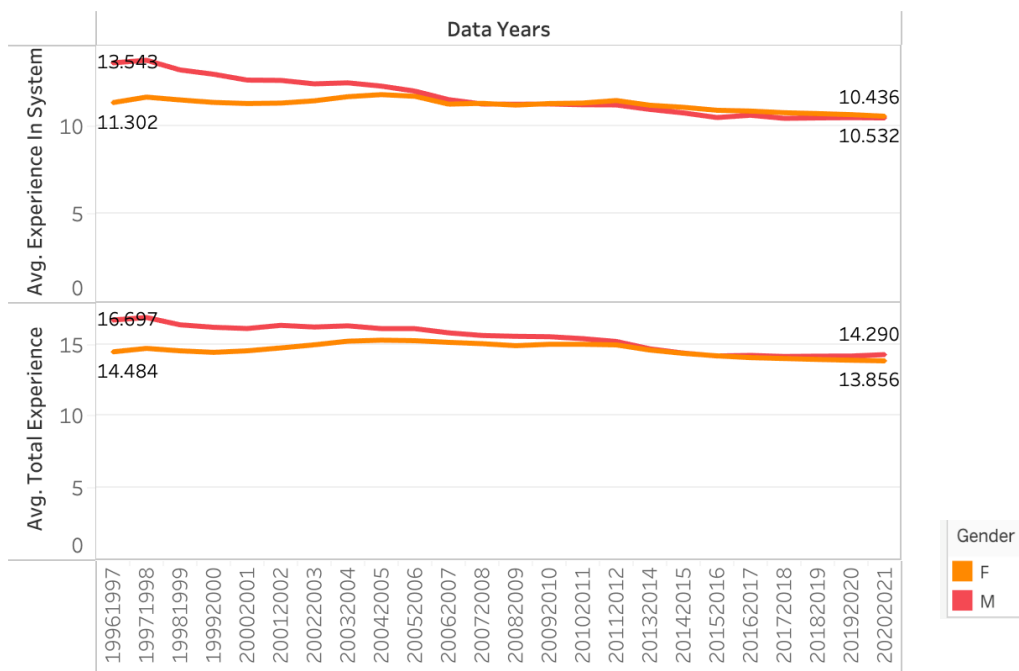
To build off the information shared in Figure 23, Figure 24 was created to view

the pattern differences between genders when looking at experience in the Nebraska

Public School system and total experience. In both graphs, there was a gap that existed of

about 2 years in in 1996 with the gap closing by 2020. There is virtually no difference in

the most recent years between genders when it comes to average years of experience

either in the state or with total experience.

Figure 25

Nebraska Administrators (preK-12) by Year by Gender
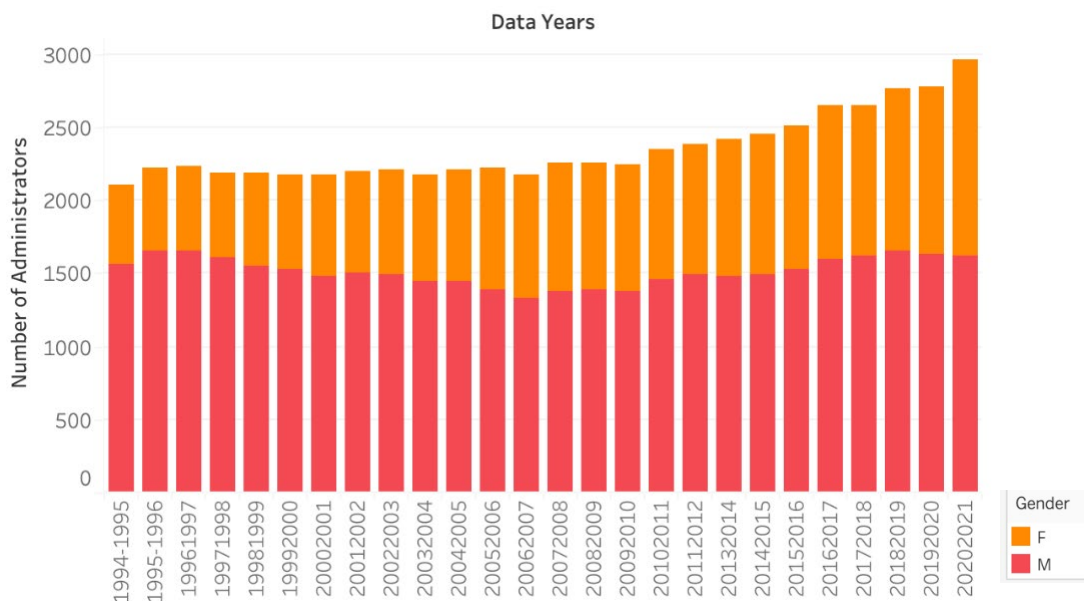
Although most of this data is targeted towards teachers, it is worth considering administrators as well. Figure 25 shows that the number of administrators is increasing annually, just as the number of teachers and students is. However, this increase from 2010 to 2021 was 14%, compared to teachers increasing at a rate of 8% and students increasing at a rate of 10%. Figure 25 also shows the separation by gender. The number of male administrators stays somewhat constant over the period while the number of female administrators continues to increase. This data is better displayed in Figure 27, which shows the rate at which the number of female administrators is increasing compared to the rate of male administrators.

Figure 26

Number of Nebraska Administrators (preK-12) by Year by Gender Detailed
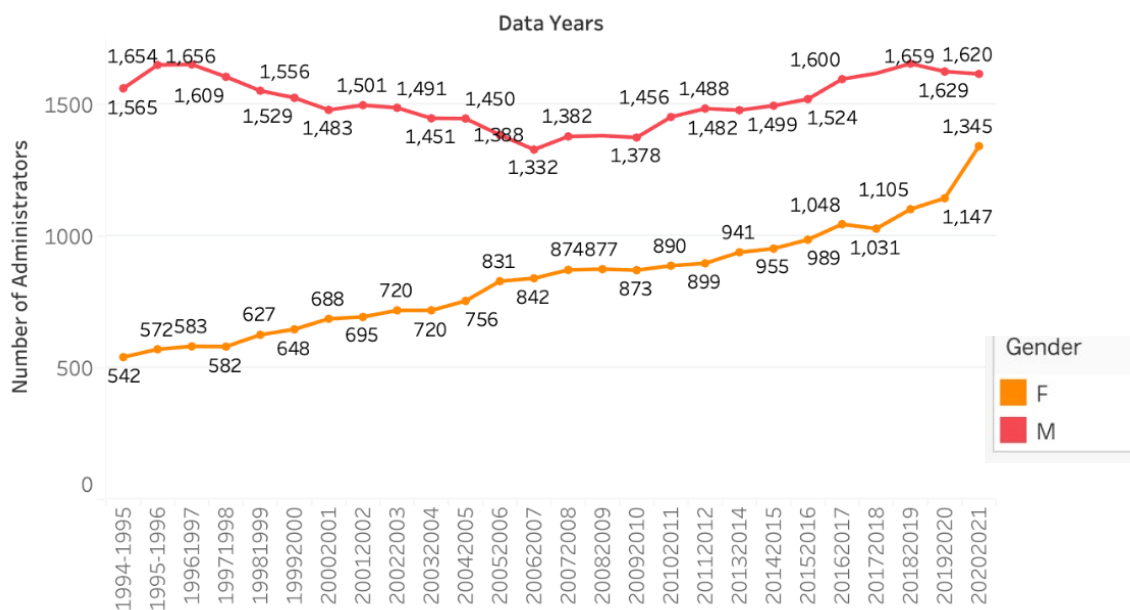
Figures 18 through 26 provide another way to explore this data set through the computer application Tableau. Although this was done without the support of a statistician, it is still important data to consider when looking at the retention data for the state of Nebraska. It is probable that collaboration with a statistician on these figures and on the Tableau application could provide even more insight and intricacies to the research. It is recommended to continue this research to find additional patterns within the data set.

Discussion

The data from Nebraska Public Schools from 1982 to 2021 provided many insights into the Nebraska teacher workforce. The following discussion will consider the findings of this study and how they fit into the broader discussion of teacher attrition on a national level.

This study utilized Survival Probability and Hazard Rates to help determine teacher attrition patterns. This was a recommendation by the UNO Statisticians because it would provide data that could be easily transferred into a visual format. Using Survival Probability and Hazard Rates was an idea that had not been seen in prior research. The Survival Analysis looked at the probability that an individual would "survive" or remain in their role from year to year. The Hazard Rate measures the occurrence of something happening in relation to a variable. In this data, the "occurrence of something happening" was the individual leaving the data set and the "variable" was time represented by years worked. Both of these mathematical calculations were used to determine teacher attrition patterns based on staff characteristics from the NDE data set.

Gender Differences. Throughout the Exploratory Data Analysis, it was found that female teachers were more likely to leave than male teachers. The Survival Probability for males was higher than females when considering all teachers from 1982 to 2021. Hazard Rates were also used to mathematically represent the data in regard to gender. The Hazard Rate for teachers, when considering gender, was pulled from one year of data rather than the entire data set. In the year 2018, the hazard rate for females was higher than males at each year of experience, meaning they were more likely to leave their teaching roles regardless of how long they had been teaching. Even though the researchers had not seen teacher attrition data calculated using Survival or Hazard Rates, the findings regarding gender were still consistent with previous research in this area. Prior research found that male teachers would tend to remain in their teaching positions at a higher rate than female teachers over time. (Han, 2023; Guarino, Santibanez, & Daley, 2006; Kukla-Acevedo, 2009)

It is likely that more research needs to be done regarding teacher gender and its connection to teacher attrition. Nguyen, et al. (2019) conducted a meta-analysis of research from a very similar time period as this Nebraska study, 1980 to 2018. Prior to 2008, Nguyen's findings showed that females teachers did tend to have a higher attrition rate, just as this research concluded for Nebraska teachers. However, when Nguyen, et al. explored studies from 2008 to 2018, the gender attrition gap appeared to have leveled out and showed no difference in the attrition rate between males and females. "It is possible that women were more likely to leave historically, but this may have changed in recent years" (p. 22).

The Nebraska data showed that in 2018 female teachers had a higher hazard rate than male teachers. It would be worth finding the hazard rates in other years to determine if the Nebraska data is consistent with Nguyen's findings or if Nebraska does not follow the gender trend found from 2008 to 2018. It is also possible that these results differ from our research because of the variables being considered. Nguyen et al. included teacher transfer data, where this data only considers teachers that leave the public schools, transfers were not considered.

Experience Differences. When considering teacher experience, it was found that the median years worked was 14 years. Citing just the median years worked for each teacher that left their role can leave many questions, especially considering that this was data from nearly a forty-year period. A more descriptive depiction of teacher career longevity was given in Figure 10. The density graph shows a U-shape curve of teachers and their number of years worked at the time of resignation. The U-shape illustrates that the largest groups of teachers leaving their role are in their first five years of teaching or are teachers

who have taught for more than thirty years. These findings are consistent with other research. Guarnino, Santibanez, and Daley (2006) conducted an empirical literature review and also discussed a U-shaped pattern of attrition in respect to age, where teachers were leaving in their first years or when near retirement. They used literature that has similarities to this study where teacher attrition was based on leaving the state's or district's public school system.

Ethnicity Differences. When examining both the Hazard Rate and the Survival Probability of teachers, there was a strong correlation between ethnicity and predictability of leaving Nebraska Public Schools. The lowest survival probability (and highest hazard rate) was for Asian and Native American Teachers. The group with the highest survival probability (and lowest hazard rate) was White teachers.

Ethnicity is a characteristic that will require a more in-depth analysis to better understand attrition patterns. Some research, such as work done by Ingersoll, et al. (2019), has some consistency with our research where they found that minority teachers had higher attrition rates than White teachers. Ingersoll, et al. used data from the Schools and Staffing Survey and the Teacher Follow-up Survey, both conducted by the National Center for Education Statistics between the years 1988 to 2012.

However, there is also research that has found that minority teachers have a lower attrition rate than White teachers, such as the literature review by Guarino, Santibanez, & Daley (2006) and the meta-analysis by Nguyen et al. (2019). Much of this research cites the school setting and student racial makeup as factors on teacher retention for both minority teachers and White teachers. An example of this can be found in research from

Sun (2018) that found minority teachers had higher retention rates when working with student populations that have larger populations of minority students.

Since there is not a consensus on a nationwide level, it is even more critical to look further into the Nebraska data to see how ethnicity has impacted the longevity of careers for Nebraska teachers. When looking at the Survival Probabilities of non-White teachers in Nebraska, further research should consider the student demographics of the schools in which they are employed.

Job Title Differences. The data set provided by the Nebraska Department of Education (NDE) included all public-school staff members, not just teachers. This allowed the examination of the Survival Probability of non-teaching positions to see how they compared to teachers and to one another.

Support staff had the lowest survival probability by a significant margin. Support staff represent a group of employees that are not salaried that work in a school, including Teacher Aids or Paraprofessionals, Custodians, and Nutrition Services. This is a group that would be worth doing more research on. These individuals and the positions they represent provide major contributions to the culture of a school and impact student learning. To better understand why their retention rate is so low compared to other school employees could help keep these individuals in their roles longer and help build consistency for students and other staff members.

The group with the highest survival rate is administrators. This could be something to investigate further, but there are a few assumptions that could be made as to why the data shows their high survival rate. First, almost all administration positions require teaching experience. So, most individuals in this group would have already

completed the first few years of teaching, which we know are the most vulnerable when it comes to retention. Additionally, this is a group that tends to have higher salaries and more education than other categories, which could contribute to their retention.

Master's Degree. Our research also attempted to examine the impact of having a master's degree on teacher retention. While Nguyen et al. (2019) found in their meta-analysis that master's degree attainment did not have a significant impact on teacher retention, our data analysis turned out to be inconclusive and identifies a topic that warrants further study. The graph that was completed for teachers who have attained a master's degree showed irregularities that would suggest that data should be validated again. The current result is inconclusive when comparing teachers with and without a master's degree.

Results Conclusion

Although the findings of this research did not result in novel findings regarding teacher attrition, it did solidify some previously assumed trends of teacher attrition in the State of Nebraska. It also provided a new data analysis strategy for determining these patterns in using a Survival Analysis Model. Considering all of the findings that can positively contribute to the conversation of teacher attrition in Nebraska and elsewhere in such a short time period, it appears that the RPP was a sufficient method to conduct research.

Possible Policy Implications

Although this research did not provide unique results of teacher attrition patterns, it did reinforce patterns of attrition that were already discovered in previous research. These patterns include that teachers are leaving their roles and the profession during their

first few years of teaching. The question that needs to be answered is how to better retain teachers during these highly volatile years.

One consideration should be how prepared teachers are when they enter the workforce. According to teachers, the most important part of their pre-service preparation is their time in classrooms, whether observing or being a participant as a student teacher (Brown et al., 2019). It is suggested to increase the preparedness and efficacy of new teachers to consider increasing the amount of time student teaching. Griffiths (2010) found that teachers who completed a year-long student teaching experience were more prepared and more confident going into their first teaching role. It was also observed in this research that teachers of color had lower survival rates than White teachers. Carver-Thomas (2018) agreed that an improvement in teacher preparation could help increase retention rates for teachers of color. It is possible that having better preparation and more confidence could lead to higher retention for the newer teachers.

Limitations

Although there were millions of data points available to the researchers, there were still many limitations of the data that, if provided, could have offered more insight into teacher attrition and migration patterns. Items that have been shown in other research to heavily impact teachers' decisions that are not in this data set include age, salary, and overall satisfaction.

Age has been found to be a predictor of teacher turnover, where teachers that are younger (20 to 30 years old) or older (age of 50 or older) are more likely to leave their role. (Ingersoll, 2001a; Barnes, Crowe, & Schaefer, 2007; Hanushek, Kain, & Rivkin, 2004b). Teacher age has a strong correlation to the years of experience for a teacher, but

it would be interesting to see whether age or experience had the larger impact on teacher attrition. Being able to compare age to experience could add another layer of attrition data that could be useful.

Teacher salary is a topic repeatedly discussed on the national level as a reason for the struggles in recruiting and retaining teachers. Other research has found that teacher salary is one of the top reasons that teachers leave the profession and that higher teacher salaries are associated with lower levels of teacher turnover (Chingos & West, 2012; Provasnik and Dorfman, 2005; Han, Babbitt, & Ingersoll, 1995; Dolton, & van der Klaauw, 1999; Luekens, Lyter, and Fox, 2004; Gulosino, Ni, & Rorrer, 2019). Ingersoll (2001) found that teachers in schools with higher salaries were less likely to leave. He wrote, "for example, an increase of $5,000 in the normal salary provided to teachers with a master's degree and 20 years of experience is associated with a 4% decrease in the odds of a teacher departing" (p. 17). If indicators of teacher salary could be included in the NDE data set, it could potentially provide critical information on teacher retention.

Another limitation of this research is that it does not provide any opinions or levels of job satisfaction from the staff. In current research regarding teacher attrition, job dissatisfaction is a theme that continues to surface (Griffeth et al., 2000; Ingersoll, R., 2001; Johnson, S. M., & Birkeland, S. E., 2003; Boyd, et al., 2011). There are many factors that can lead to job satisfaction or dissatisfaction. Provasnik and Dorfman (2005) found the five most commonly reported sources of dissatisfaction among teachers who transfer were lack of planning time, too heavy of a workload, too low of a salary, problematic student behavior, and lack of influence over school policy. Thornton et al. (2008) found in their study of 181 teachers who had recently transferred that the leading

causes were leadership issues, concerns about professional success, and building factors. Boyd et al. (2011) found in their study of first year teachers that administrative support has the greatest impact on retention decisions.

Teacher retention factors are no different in Nebraska. Offner (2023) did a survey of 645 teachers and administrators and found that administrative support was the largest contributor to teacher retention, followed closely by school and community culture.

Although much can be learned from looking at teacher demographics as this research has done, there is also much to be learned from teacher opinions and understanding what initiated the decision to leave a public school. The demographics paired with the reasoning could potentially give the most insightful information for Nebraska leaders.

This study considered the relationships between teacher mobility and the demographics of the teachers that are staying or leaving the profession in Nebraska Public Schools. The long-term goal is that the completion of this dissertation along with the completion of the dissertations by other members of NEPRL will not only provide useful information to both the Nebraska Department of Education and the Nebraska Legislature, but also establish that this type of Research-Practice Partnership is a worthwhile method to conducting educational research. Hopefully, some of the results will help positively influence decisions to better recruit, hire, and retain teachers throughout the State of Nebraska.

Areas of Further Research

This research provides a starting point for further exploration of the data provided by the Nebraska Department of Education. The intent is that other researchers will

expand the work to find more patterns that can be used to better understand teacher attrition in Nebraska Public Schools. This section will discuss other areas that should be considered for further study using the data provided by NDE. Areas that were hypothesized about or considered, but due to time constraints could not be explored thoroughly.

When considering the differences in gender, the research showed the attrition rates for female teachers were higher than males. However, with the consideration of Nguyen's (2019) research where they found that in the last ten years the trend of females leaving the profession sooner than males had changed, it is suggested to find a way to break down the Nebraska data by year. This could help determine if the attrition patterns of male and female teachers have changed over time in the state of Nebraska or if it has maintained. Since the data analysis from Sinha (2022) does not delineate by year, the Nebraska Public Teacher workforce from 1982 to 2021 was considered one whole group and there were not designations made based on the year the data was from, which is what was attempted with Tableau. Separating the data by year would not only be important when considering gender but would be important when considering any characteristic of the teacher population. The analysis of all the teacher and school characteristics would benefit from yearly breakdown. The year-level information would be critical to better understand the implications that economic crisis, federal and state accountability mandates or health crises may have on retention.

It should be explored further whether Nebraska has attrition concerns across all areas, or if the concerns are localized since high rates of attrition could be found within demographic pockets based on school characteristics. This would require a more

intensive examination of school locations and school characteristics when sorting teacher attrition data. A study to consider is Edwards et al. (2022) where they studied Tennessee teacher vacancy patterns. They found that in Tennessee, while there did not appear to be a major shortage since only 2% of all teaching positions in the state were unfilled, the areas of vacancy were concentrated. Many of the unfilled positions were in high school with higher vacancies in the subject areas of Math, Foreign Language, Special Education, ESL, and Science. These findings parallel the findings of other research where the areas of highest teacher attrition are in Special Education and STEM content areas, such as Math and Science. (Boe, Bobbitt, & Cook, 1997; Ingersoll, 2013; Barnes, Crowe, & Schaefer, 2007; Gulosino, Ni, & Rorrer, 2019; Nguyen, et al., 2019). As teachers are leaving Nebraska Public Schools, understanding which content areas and grade levels are seeing the highest attrition could be significant.

Additionally, when considering localized shortages, geography could also be a factor. Nebraska has a diverse population landscape with many school districts that are rural and some that are within a metropolitan area. Determining the location of the school district and the size of its community would be relevant. Gulosina & Rorrer (2019) found that teachers are more likely to leave schools in urban and rural settings than suburban schools. This could mean that the Metropolitan suburbs could have lower attrition rates than rural areas in the state. Future researchers should also explore attrition patterns based on location.

School characteristics and how they impact teacher attrition is another area that can be explored with the available data from NDE. Many researchers have found that teachers in low-performing schools have a tendency to leave the profession or transfer to

high-performing schools (Hanushek, Kain, & Rivkin; 2004b, Barnes, Crowe, & Schaefer, 2007; Boyd, Grossman, Langford, Falch, T., & Rønning, M., 2007; Loeb, & Wyckoff, 2008; Giefsen & Gunnes, 2020). Also, many researchers have found that teachers are more likely to leave schools that have high rates of poverty (Ingersoll, 2001; Ingersoll, 2001a; Hanushek, Kain, & Rivkin, 2004b; Provasnik & Dormfman, 2005; Barnes, Crowe, & Schaefer, 2007; Boyd, Grossman, Langford, Loeb, & Wychoff, 2008, Falcon, T. & Ronning, M., 2007). It should be considered in future data analysis if these patterns hold true in Nebraska's Public School data.

Lastly, a recent consideration when talking about teacher attrition patterns over the last forty years is the impact of the Covid-19 Pandemic. There has been much speculation that the pandemic has had a negative impact on teacher attrition. The data provided for this research ended in 2019. The pandemic impacted Nebraska schools in 2020. Future researchers should secure more recent data from the Department of Education to review how the pandemic, and the economic turmoil that followed, impacted teachers in Nebraska. Following the pandemic, teachers were reporting that they were going to be leaving the profession at a higher rate than years prior to the pandemic (Steiner & Woo, 2021; Wagner, 2022). However, there are also findings that contradict that notion, such as research done by Goldhaber & Theobald (2022) who found that the overall teacher turnover rate after the 2020–2021 school year was well within the range of turnover rates observed during pre-pandemic years. There is still much to be learned about how the pandemic impacted the teaching landscape. Acquiring more recent data will be critical to continuing this research to understand teacher attrition patterns and shortage areas.

Summary

Chapter Four provided not only the results of the Research Questions, but also provided details of the process of the Research Practice Partnership. The results provided from the Thesis written by D. Sinha provided us with patterns of teacher attrition that were consistent with much of the national data on teacher attrition. It also provided a new model to use to consider teacher attrition, Survival Analysis. There is much to be taken from the data and visuals results presented in this chapter.

Additionally, Chapter Four outlined the process that was required to get these results. It outlined the data analysis and cleansing that was conducted by the practitioner and researcher. It provided how the expertise of each individual was necessary to crease a consumable set of results for practitioners and policy makers. It has been established that a RPP is a worthwhile research process for analyzing data sets, especially in the topif of Education. Chapter 5 will provide some discussion of further research both for the NEPRL and for potential RPPs.

Chapter 5

As the title of this dissertation suggests, the experience of the RPP in the NEPRL context was a major part of this dissertation journey. Because NEPRL is still in its development, the author would like to make recommendations for the future NEPRL collaborative investigations.

Onboarding to the Data Set

Ideally, the de-identified data sets provided by NDE can be referenced for future work. Moving forward, the data cleaning and adding/subtracting decisions must be clearly documented and understood. This provides transparency in the process and trust in the results. While hands-on exploration of any data set is needed in the learning process, efficiencies can be found when future research references previous decisions.

Parallel Exploration

The introduction of the statistical program Tableau happened too late into the process. As this RPP started, the statisticians had the access to the data and the software that allowed the data to be manipulated and visuals be generated. This resulted in many barriers and frustrations for the RPP. As denoted in Chapter Four, there were formative graphs that had been created but not saved. If both parties would have had access to the data and software, these graphs could have been either saved or recreated at a later time to allow the reader a better understanding of the data cleansing process.

Providing both the researchers and practitioners access to the data and to a statistical program such as Tableau can have many advantages. It would allow the practitioner to have a better understanding of the data and how it can be manipulated for consumption. Often, the practitioner will better see and understand the data depth and

breath, allowing for patterns or potential areas of inquiry to be uncovered that the statistician would not realize is consequential. Providing both parties access would open the potential for more significant patterns to be uncovered.

If both parties had access to the data and the statistical software, it also would have increased the collaboration between the two parties and allowed for better dialogue. As this RPP progressed, there were weekly meetings between the researchers and the practitioner that typically resulted in the researchers providing their findings and then the practitioner asking questions, clarifying, or suggesting new items to look at. The dialogue was slow because of the required scheduling of the meetings to have the conversations. If both parties had access, the exploration could have looked much differently where both parties could have been cleansing and manipulating the data and comparing results rather than the model used. If both had access, it could have enhanced the discussions and made the conversations more efficient.

Ideally, in Chapter Four, the section titled "Additional Results" would have been a part of the initial data exploration at the beginning of the partnership rather than the end. The practitioner found patterns that could have been impactful for the statistician to explore further. Having the combined access for both parties could have led to more efficient sharing of expertise and allowed development of a deeper level of trust between both parties throughout the process.

Enhancing Policy Impact

The purpose of this study was to demonstrate the usefulness of RPPs by showcasing the process of a local RPP with possible policy implications through analyzing teacher attrition patterns over many years. Where this project needed to be enhanced is the process of making sure the results were consumable for policy makers. The RPP provided accountability and reliability for the research to be trusted. However, it did not provide results that could be easily consumed by policy makers and actually impact policy.

The use of the Survival Model and the creation of the figures presented in this research provided groundwork for future research and provided patterns that need to be further explored. However, as discussed in Chapter Four, there is a need for a year-by-year breakdown that would provide better information for those that are making decisions. Unfortunately, most of the results were an accumulation of all staff from 1980 to 2021. Although useful to understand some basic statistics regarding public school staff, it did not get specific enough to influence policy. There needs to a delineation by year so that policy makers can see how patterns have changed over time, especially after significant events such as economic crises, federal and state accountability mandates or health crises.

Once these patterns and visual representations have been established, it would be suggested that NEPRL work together to provide a succinct summary that can be easily digested. Having the support of the University of Nebraska-Omaha will bring a level of credibility and trust that could lead to changes and adjustments by policy makers.

Future NEPRL Study Recommendation

The author recommends considering an authentic Exploratory Data Analysis (EDA) for future studies. During this study on Nebraska Teacher Pipeline, specific questions were brainstormed and determined. The research team collaborated to ensure assumptions did not determine inquiries. In that sense, the goal-free perspective and team accountability were successes in the NEPRL RPP. Because of the nature of collaborative projects and the skill development of the NEPRL team, EDA could be very interesting to consider. The following is some additional information regarding EDA for the reader to consider.

Exploratory Data Analysis

An Exploratory Data Analysis is a method where researchers analyze existing empirical data, rather than creating data through a formal experiment, with the goal of detecting new patterns and creating data driven predictions (Good, 1983; Jebb et al., 2017). The EDA method was conceived by John W. Tukey (1977), by providing techniques to discover patterns within already existing data, the method helps maximize the value of data by not being constrained to initial sets of hypotheses or prior research (Jebb et al. 2017). Other types of research generate a hypothesis, then consider the data to confirm or refute the hypothesis. EDA does this in reverse, looking at the data and then formulating a hypothesis.

EDA is oftentimes compared to detective work. Where in a criminal case, a detective would consider all the data, uncover the information, and then create a case against the defendant. Then the lawyer argues that case. EDA fits with the detective

model because its role is to establish pre-trial evidence and hunches (Behrens, J. T., 1997).

According to Tukey (1993) the principles of EDA are: a willingness to find unexpected phenomenon, having a flexible mental attitude, using smoothing techniques to clarify data, using simple mathematical calculations along with using robust statistics, building models, recognizing the incompleteness of models, being able to see the results, and identifying reasonable patterns.

Myatt et al. (2014) provided an outline on how to conduct EDA: problem definition and planning, data preparation, analysis, and deployment. Problem definition and planning encompass knowing the goals, data, and the team that will assist in the process. Data preparation is taking the data and manipulating it through summaries, visualizations, error corrections, and segmentation to give the researchers a clearer picture. Analysis is completing the regression analysis, recognizing patterns, grouping the data, exploring relationships, and summarizing findings. During the data preparation and the analysis phases of EDA, it is important to consider a variety of data analysis techniques to better understand the data and recognize patterns. Often, these techniques are visual because visual representation can add a great deal of insight to a numeric summary. Some common techniques are frequency counts, histograms, graphs, scatter diagrams, and correlation coefficients (Good, 1983). Then the deployment phase is the generation of the report and the research's impacts.
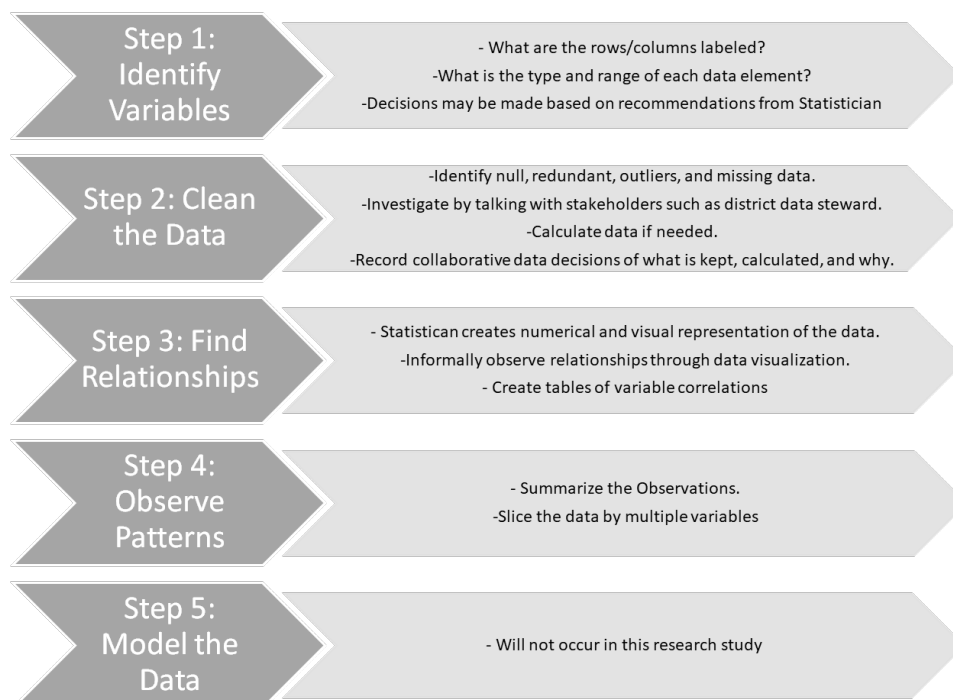
A drawback of EDA is that the researcher will not get truly deep results. EDA will provide surface level information to help formulate hypotheses. Generally, there is more research necessary after conducting EDA to better understand the patterns and

phenomena that are uncovered. Jebb et al. (2017) writes, "The most significant statistics should never be interpreted as representing some final, absolute, truth. The inability to make strong scientific claims is an important limitation of EDA" (p. 267).

In summary, the EDA process is a method used to explore data without any underlying biases, aspirations, or focus except to uncover patterns and trends within a data set. The researchers must come into the process open to finding whatever the data provides. However, the process also requires having the time and patience to sift through and cleanse the data to where those patterns can be uncovered.

Figure 27 shows a visual representation of the EDA process based on work done by Tukey (1993), Jebb et al. (2017), Myatt et al. (2014) and Behrens (1997). There are parallels to the framework presented by Myatt et al. (2014), which is explained further in the Exploratory Data Analysis section with some adjustments to account for collaborative research methods.

Figure 27

Exploratory Data Analysis Process

Step 1: Identify Variables
- What are the rows/columns labeled?
- What is the type and range of each data element?
- Decisions may be made based on recommendations from Statistician

Step 2: Clean the Data
- Identify null, redundant, outliers, and missing data.
- Investigate by talking with stakeholders such as district data steward.
- Calculate data if needed.
- Record collaborative data decisions of what is kept, calculated, and why.

Step 3: Find Relationships
- Statistican creates numerical and visual representation of the data.
- Informally observe relationships through data visualization.
- Create tables of variable correlations

Step 4: Observe Patterns
- Summarize the Observations.
- Slice the data by multiple variables

Step 5: Model the Data
- Will not occur in this research study

Based on work done by Tukey (1993),
Jebb et al. (2017), Myatt et al. (2014)
and Behrens (1997)

Conclusion

Throughout this Research-Practice Partnership, data provided by the Nebraska Department of Education so that patterns on teacher attrition could be explored for purpose of having policy implications. The framework used was based on the Prepare, Do, Share Conceptual Framework (Williams, et al., 2020) but overlayed three essential components to a successful RPP: expertise, trust, and adjustments. The Plan, Do, Share Framework was missing the interpersonal and leadership considerations needed to make a successful RPP work, especially one that needs to have an immediate impact on educational policy.

This research displayed a successful RPP as the Plan, Do, Share model was followed because the partners were able to share expertise with one another through sharing of ideas, meetings, and written communication. They were able to develop trust with one another by being prepared, bring relevant information to the research process, and following through on assigned tasks throughout the process. As the partnership worked together, the project saw many adjustments that were necessary to provide a provide that can be useful and relevant to the current teacher climate.

The NEPRL will continue this research to expand the understanding of teacher attrition in Nebraska. RPP is a model that would be suggested to continue to utilize as it brings practitioners and researchers together to provide high quality research for others to utilize.

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