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# Analysis of factors influencing West Virginia secondary biology and science teacher attrition rates

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# ANALYSIS OF FACTORS INFLUENCING WEST VIRGINIA SECONDARY BIOLOGY AND SCIENCE TEACHER ATTRITION RATES

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by

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## ABSTRACT

The high rate of attrition for beginning teachers has been blamed on many factors. Nationally these include low pay, urban versus rural school settings, age, with younger teachers leaving sooner, and other variables making a complex problem with no clear component responsible for the loss of teachers. This study examined the self reported variables that contribute to high school teachers in West Virginia leaving their profession. An electronic survey instrument was distributed to current secondary teachers across the state. Teachers were asked to respond to questions related to professional satisfaction, perceived value from students and parents, administrative support, content versus education degree, demographics, teacher background, and intention to stay or leave position. The data was gathered anonymously and statistically analyzed. Retention factors identified by this survey are an increased satisfaction with the profession if teaching within the content area of their undergraduate degree. Majoring in the subject being taught increases satisfaction with the teaching profession as a whole, and within those respondents teaching in STEM disciplines, having a content degree in the Biological Sciences, and teaching Biology, gave a lower number planning to leave within five years.



**Keywords:** Assessment, Biology, STEM, Secondary Education

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Seth Perry

# TABLE OF CONTENTS

## LIST OF TABLES AND FIGURES

## INTRODUCTION AND LITERATURE REVIEW

Teaching is the profession that teaches all professions. With that in mind, one would assume that the American school system would be composed of educators that were the best and brightest, facilities that were modern and new, and that teachers had resources and technology that enabled them to develop students to become leaders in a quickly changing 21st century. However, one doesn't have to look far to see that the American school system is suffering many setbacks. Teachers in many states continually fight and lobby to have competitive pay in the current job market. In many rural and urban areas school buildings and facilities are crumbling and falling apart which are placing teachers' and students' health at risk. Insufficient funding and lack of technology not only puts students at a disadvantage, but sometimes forces teachers to supply their classrooms with their own money. These are all important and relevant issues. Nevertheless, would it do well for a school district to have state of the art facilities but no teachers to walk through the doors? How about having the best technology available with no qualified educators to use it? While these are relevant concerns in the American school systems across the country, the one issue that could matter the most is that they are consistently having problems staffing their schools with highly qualified teachers (Ingersoll 2006).

Various reasons have been suggested for the reason behind the problems with school staffing in American high schools. One thing is certain, the supply does not equal the demand and many schools are not being able to find qualified teachers to fill their vacancies. Dr. Richard M. Ingersoll, a former high school teacher and current associate professor of education and sociology at the University of Pennsylvania, suggests that a

larger part of the problem is teacher attrition and the ability to keep teachers in the profession once they begin service (Ingersoll 2003).

This problem of teacher attrition has in no way been ignored by the public. It has been increasingly identified as a problem in the national media and many states have instituted new policies and agendas just to combat the problem of understaffed schools. The U.S. Department of Education's statistics research branch, the National Center for Educational Statistics (NCES), designed and implemented the Schools and Staffing Survey (SASS) and the subsequent, Teacher Follow-up Survey (TFS), and has surveyed random schools and teachers since the late 1980s. This Schools and Staffing Survey is the largest and most comprehensive survey that assesses the staffing, occupational, and organizational aspects of schools. It is a broad and random sample of about 50,000 teachers taken from schools in all 50 states and included about 12,000 schools. The studies have been employed regularly and four cycles of surveying have been completed ranging from 1987 to 2001. Of those teachers surveyed, those who leave the teaching profession are requested to complete the Teacher Follow-up Survey. The TFS is a questionnaire consisting of factors that exiting teachers identify as reasons why they are leaving the profession.

Dr. Ingersoll has been researching the results from the SASS and the TFS in order to study a number of issues concerned with teacher supply, quantity, and demand, and he has identified some important trends within the data (Ingersoll 2006). He affirms that in the media and within the school systems themselves, there is an overwhelming idea that the reasons that schools can't keep qualified teachers in the classroom is because of two issues: retirements and increased student enrollments (Ingersoll 2006). After examining the data, Ingersoll says that conventional wisdom does indeed prove true. Since the mid-

1980s, teacher retirements and school enrollments have indeed been on the rise, and just as suspected, the demand for teachers is also increasing. However, Ingersoll explains, this is where conventional wisdom and data begin to diverge. The data show us that most of the hiring at the beginning of the school year has little to do with retirements or student number increases but simply to replace those teachers that left the profession at the end of the previous school year (which didn't leave because of gray hair) (Ingersoll 2006). The average number of teachers that leave, move, or depart from their school district remained around 14% (Ingersoll 2003). Ingersoll also discovers that one group of teachers has a turnover rate that is extremely high when compared to the others: the beginners. The data from the TFS and the SASS show that within the first year of teaching, around 14% of beginning teachers will leave the profession. After their second year, 24% of those teachers will leave. Once these beginning teachers have reached their fifth year of teaching, close to 50% of those teachers will have left the profession altogether (Ingersoll 2006). What should be realized, as Ingersoll suggests, is that teaching is a very large profession and should include those teachers that not only leave the profession but "move" within the school systems and districts. In the big picture these teachers are still in the system, so to speak. In reality, however, these are still vacancies that schools must still try to fill in the incoming year. Using data from the 1999/2000 school year, he illustrates that at the beginning of the school year there were 534,000 entrants into the national teaching force which at the time was around 3,400,000 teachers. At the end of that school year, there were approximately 546,000 teachers that were leaving. So, as Ingersoll explains, in this 1999/2000 school year, roughly a third or around one million teaching jobs were in some state of transition of entering or exiting the teaching profession. It should be noted that almost all occupations have some degree

of turnover and this is to be expected. Ingersoll advocates that small amounts of turnover can lead to stagnancy within the organization and eliminating low-caliber workers may increase efficiency while hiring new employees can lead to innovation and new ideas (Ingersoll 2003). But because the teaching workforce has a high number of teachers in transition from year to year, schools and state departments should not only see this as a problem of staffing schools but of its association to school performance.

Because of the lack of available teachers for hire, many school districts have implemented programs to increase their teacher supply (Ingersoll 2003). Many states have implemented alternative certification programs that allow students to forgo finishing their formal education to begin teaching immediately. Some states allow for signing bonuses, student loan forgiveness, and housing assistance to help increase in the hiring process (Ingersoll 2006). While some of these programs sound like promising ways of getting new teachers into the classroom, it can lead to an increase in unqualified teachers. Ingersoll and Curran comment that the quality of teachers and the quality of teaching are undoubtedly among the most important factors shaping the learning and growth of students. So the solution of increasing the quantity of teachers by lowering certification standards and recruiting out-of-field teachers in order to get a teacher in the classroom has the potential to decrease the quality of education for students (Ingersoll and Curran 2004). Even if increasing the quantity of teachers was to succeed in getting new teachers into the classroom, it doesn't solve the problem that once those teachers are in the classroom, around 40-50% of those new hires will leave within the first five years of teaching service (Ingersoll and Smith 2003). The rates are much higher for teachers that enter the field with less preparation, training, and mentoring (Darling-Hammond and Sykes 2003). School systems can't stop those teachers who have devoted their years of

service from retiring and they can't ignore the fact that the number of students enrolling in schools is also increasing. However, they can look for the reasons that many teachers, especially new and beginning teachers, are leaving the teaching profession so early.

If the data is correct and schools aren't hiring teachers because of retirements or student increases, then why are they experiencing a staffing shortage? In the SASS and TFS surveys, teachers are asked to give reasons for their wanting to leave the profession. Surprisingly, the lowest percentage of teachers leaving left because of retirement with about 13% reporting. This number seems to go against the reported root of the problem- a retiring teaching force. School reorganization and layoffs made up around 20%. Family and personal reasons made up around 40% of teachers leaving the profession. Ingersoll points out that these personal reasons such as, raising a child, taking care of the elderly, or spouse moves for a new job happen with all industries and occupations and are just a part of life. Still, some interesting trends emerge with the last two categories. About 27% of teachers left the profession because they wanted to pursue another job. On top of that, roughly 29% left or moved from the profession because they were dissatisfied. Combined, these two reasons make up over half of the flow of teachers out of the national teaching force (Ingersoll 2006).

Looking at the teacher shortage in more detail, Ingersoll's research shows that the shortage will affect some teaching disciplines more than others. Due to the specificity in the data analyzed by Dr. Ingersoll within the TFS and the SASS, one is able to identify which disciplines in teaching have been experiencing the most turn over. Among all teaching fields, studies show that math and science teachers have the highest rate of turnover among all disciplines. Why not focus on all of the secondary teaching disciplines? The reason to identify and focus on these teachers is because American

students must have a solid and competent background in the math and sciences to remain competitive in the national and global job markets. According to the National Science Teachers Association, of the 20 fastest growing occupations projected for 2014, 15 of them require significant mathematics and science preparation to successfully complete the job. The alarming trends show that the U.S. ranks 32nd out of 90 countries in undergraduate natural science and engineering degrees and the total number of engineering degrees has dropped 20% since 1985 (Froschauer 2006). The data on teacher turnover and the trends in the job market show that American high schools are losing science and math teachers when their role in the classroom is the most important. Roughly 16.4% of math teachers and about 15.6 % of the science teachers leave every year which is higher than the average for all teachers at 15%. In looking at the science teachers leaving the teaching force, school systems are finding it much more difficult in finding life science teachers than teachers in the physical sciences. When comparing the reasons given by math and science teachers for leaving the teaching profession to the reasons all other teachers' gave for leaving, the math and science teachers indicated that they are 10% more likely to say they left the profession because they were dissatisfied. So are West Virginia schools showing the same trends of losing math and science teachers and at the same time finding it hard to fill these math and science teacher vacancies? Absolutely. Demographics play a large role in the teacher turnover trend. Small, rural and poor schools accounted for 22% of annual teacher turnover which is higher than the average of teacher turnover of 15%. Many teachers will leave the West Virginia school system for other state school systems that offer higher pay, more opportunities for advancements, and better facilities.

In a recent report on report on West Virginia's teacher shortage, the State Superintendent of Schools said that the state has positions posted in mathematics, the sciences, and world languages that are not filled by qualified candidates (Paine 2007). Paine says that the problems facing West Virginia's public schools are the result of two factors. He explains that there is no adequate supply of teachers entering into the profession and that there is an up and coming generation of teachers that will be available for retirement. During the 2005-06 and the 2006-07 school years, roughly 10 percent of the classroom positions were not filled by educators licensed in their specific content area. That percentage is up 7% from the 2004-05 school year (Paine 2007). The problem, Paine explains, is that the situation is made more complex because there is a lack of graduates from teacher preparation programs in critical areas of need. The ratio of positions posted and the number of graduates produced for the 2006-2007 school year varies by discipline. However, in the science and math disciplines, the number of graduates produced was not enough to fill the positions posted. See Figure 1.

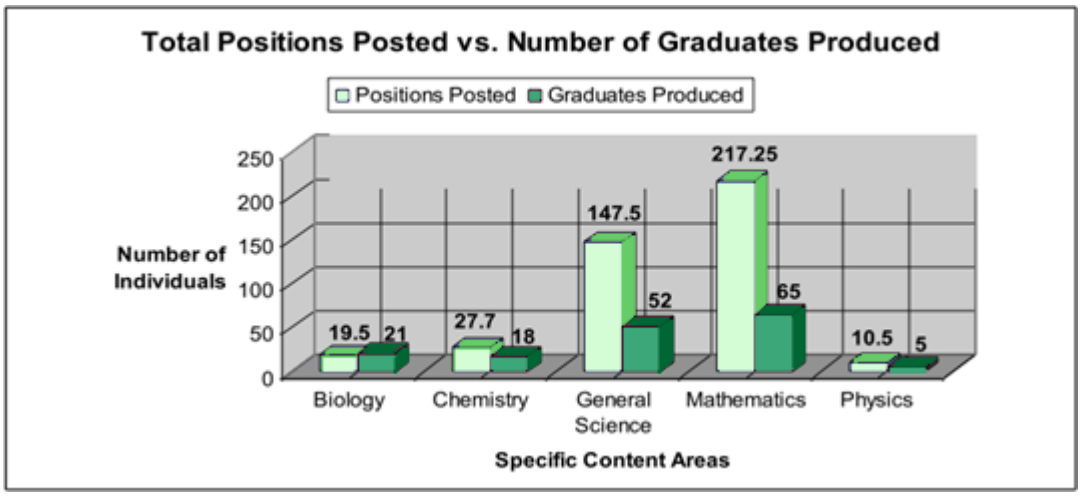


**Figure 1:** *Total number of positions posted with the total number of graduates produced by WV Higher Education Institutions. "State Superintendent's Report on West Virginia's Teacher Shortage".*

Dr. Paine gives us the retirement projections for the next four years for eligible teachers. In 2009, there will be 6,495 teachers eligible for retirement. By the next year, that number jumps up by over 1,000 employees to 7,589. In 2011, 8,576 teachers will be eligible and in 2012, nearly 10,000 West Virginia teachers will be eligible for retirement (Paine 2008). This is an alarming trend and there will surely be shortages. The WV Department of Education and local school districts have been coming up with long-term and immediate solutions. Possible long term solutions included loan forgiveness for future teachers in the math and sciences and have colleges and universities to implement middle level content preparation along with elementary education programs. Paine explains that West Virginia has a surplus of elementary and K-8 specialized teachers. So, therefore, one solution would be to "steer" these teachers into teaching the much needed math and science positions. Another immediate solution would be for individuals that hold degrees in general science, physical science, biology, and chemistry to attend a week-long and intense professional development session that would train these teachers to have the opportunity to teach biology or chemistry. According to Dr. Paine:

> "A comprehensive approach to the situation offers both long-term and short-term solutions. While long-term solutions rely upon West Virginia's ability to recruit qualified teachers to our classrooms, there still remains of the issues that currently exist. To face the immediate concerns, we must look to our existing pool of talented teachers. West Virginia is fortunate to have a workforce of competent and experienced educators that can be taught the essential concepts and instructional strategies of mathematics, the sciences and world languages." (Paine 2007)

Schools should look to the pool of talented teachers that currently exist in the state. However, if school systems are talking about taking teachers from other content areas and retraining them to teach something out of their field they should know that this idea itself can be detrimental to the success of West Virginia schools. According to the research composed by Ingersoll and Curran, having teachers retrained in subjects that do not match their backgrounds may allow them to become highly unqualified. Although it would be a quick fix, it most certainly may cause more problems not only for the teacher but for the quality of education of the students in that class (Ingersoll and Curran 2004).

Through February and March of 2008, West Virginia State Board of Education, under the leadership of the West Virginia Department of Education, the West Virginia Education Association and other stakeholder groups working with the New Teacher Center at the University of California at Santa Cruz conducted a survey of all school-based licensed educators to determine if they were supported and empowered and whether they experiencing a positive working environment. It is hoped that the VITAL (Vision for Teaching and Learning) survey will help give policymakers the opportunity to make data-driven decisions for developing policies that make West Virginia schools great places to work and learn. Roughly 10,000 West Virginia educators (43%) took part in the survey. One of the trends found in the data were West Virginia educators are generally satisfied with their school. Roughly 78 percent agree that their school is a good place to work and learn. About 50 percent strongly *agree* that their school is a good place to work and learn and less than 8 percent strongly *disagree* (Hirsch 2008). However the next portion of data is rather interesting. Few survey takers indicated that they wanted to leave their school or education altogether. More than four out of five teachers want to remain in their current school (82 percent), while 5 percent indicate that they want to continue

teaching, but in a different school or district, 6 percent want to leave teaching but remain in education and 7 percent want to leave education entirely (Hirsch 2008). Even though the VITAL survey says that West Virginia teachers feel that their schools are great places to work and learn, more research should be followed up on the teachers that want to leave their district, want to leave teaching but remain in education, and those that want to leave entirely. It doesn't matter if the teachers in West Virginia are happy about their work or if they hate it. West Virginia is still experiencing a teacher shortage and the numbers within the data show it will be increasing with retirees.

At this point it is imperative to ask why West Virginia math and science teachers are leaving their teaching profession. According to Ingersoll's work, when compared to teachers leaving for retirement and personal reasons, the science and math teachers are no different from the average. However, when it comes to teachers leaving to pursue another job or just leaving because they were displeased with the teaching profession, science and math teachers overshadow the average (Ingersoll 2006). While some may think this is reason to panic, the fact that math and science teachers are leaving because they are dissatisfied may actually offer a way of finding a solution. As, Ingersoll states it, these reasons of dissatisfaction are actionable. The purpose of this research is to determine what factors or situations are affecting West Virginia's biology, math, and science teachers. Instead of getting an overall opinion of how the teachers feel, this survey intends to identify trends in the data, if there are any, which could be contributing to the significant decline and absence of highly qualified math and science teachers. If state and local school boards can identify the reasons that math and science teachers are leaving, in effect, they can do something about them. In order to ensure that America's classrooms as well as West Virginia's classrooms are staffed with highly qualified science and math

teachers and to make sure these teachers stay in the profession, school systems and departments of education must identify the reasons they are more likely to leave for another job and what exactly they find most dissatisfying about teaching.

## MATERIALS & METHODS

In order to determine the relative value of different variables related to secondary teacher attrition in West Virginia an assessment instrument was created. The assessment survey was conceptualized using published variables found in national studies. These lists were tremendously broad and eventually were narrowed down to those variables specific to West Virginia teacher training (RESA certification; Mentoring) and the influence of undergraduate major and its influence on professional satisfaction and perceived value. The use of an online survey was selected as the best means to attain the necessary information from West Virginia secondary teachers. The questionnaire was designed by the researchers, which allowed flexibility for question construction, and distribution while maintaining complete anonymity for participants. The survey method is a way of collecting and gathering information using interviews or questionnaires. Considering the fact that West Virginia teachers would be surveyed from across the state, it was concluded that it would be cheaper and easier to administer a questionnaire rather than conducting various personal interviews throughout the state. According to Dr. Bob Bickel, Marshall University (*personal communication*), questionnaires can help promote a greater amount of honesty among those being questioned on the basis that they are able to maintain their anonymity. This allows those giving information to feel more secure and protected to say things that they might not normally consider saying during a personal interview which provides the researchers with a more accurate representation of the data being collected. Questionnaire surveys enable the subjects to report on a wide variety of questions concerning their personal background, knowledge, attitudes, perceptions, and opinions. Another advantage is the ability to have repeatability with consistency with our

research. In using a questionnaire, our questions, layout, and format will continually remain the same and can reduce the amount of error that could have resulted from various sources by having the same standardized format for each individual.

The creation of the online survey was done by using Microsoft FrontPage to design the survey page layout. This HTML editing program allows the user to design the page and upload it online so others can view it using any browser that has access to the World Wide Web. The online survey was linked to a Microsoft Access database management file which enables us to have an easy way to create and manipulate the collection of our data. This database manager would collect the data that the subject submitted into the survey. The entire survey system consisted of a login page, the webpage with the survey itself, and a page thanking the subject for participation. These pages were uploaded to the server and could be put online or taken offline depending on when the survey was to be administered.

The content that the survey included was decided based upon previous and current research that was conducted seeking similar information regarding teacher attrition. The assessment instrument had forty three items to be answered by participants. A copy of the instrument can be found in Appendix A. The first twelve items were related to demographics. These included 1) gender; 2) length teaching; 3) undergraduate major; 4) teaching specialization; 5) method of certification; 6) highest academic degree; 7) hired with or without certificate; 8) if teaching was primary goal; 9) participation in WV new teacher mentoring program 10) mentoring satisfaction; 11) intention to retire from teaching early; 12) how many years before retirement. The last two items on the assessment allowed for 42) comments and 43) state and county of employment. The remaining twenty nine items asked for the participants' perceived satisfaction with 13 –

17) Administrative Support; 18 – 21) Physical Setting; 22 – 27) Teacher Resources; 28 – 31) Opportunities for Professional Advancement; 33 – 33) Peers; 34 – 37) Parents and Students; 38 – 41) Educational Background.

For items that were asking for perceived satisfaction, specifically 13 – 41, responses were given on a scale. The scale consisted of five Likert items, commonly used in research of this kind (Pedhazue *et al*., 1991). N/A (not applicable) was given a value of zero; None was given a value of one; A Little was given a value of two; Moderate was given a value of three; Very was given a value of four; Very Much was given a value of five. For statistical analyses the data were converted into a numerical score using the above scale and then divided into our different demographic groups. There are many statistical methods in use to determine what characteristics are important in influencing teacher satisfaction and retention. The two most commonly used methods are bivariate and the multivariate analyses (Shen 1997). Multivariate analysis is frequently used to determine the relationships of two or more independent variables on the dependent variable. For example, by employing the multivariate approach one would be able to determine whether age, race, gender, and school location could all influence job satisfaction of an educator. On the other hand, bivariate analysis is the simultaneous analysis of the relationship of two variables. Essentially it would be teacher retention vs. another variable, such as, content area or salary.

Numerous ways were discussed on how the survey instrument would be delivered to the teachers. Options included personal visits, paper surveys that could be mailed, and online surveys that could be done using a database, email, and the internet. It was decided that the online survey would work best. This decision was made considering that it would be easy distribution, less time consuming for teachers, and the collection of data would be

automatically placed in to a database. Before surveying began, high schools and their administrators throughout the state were informed of the survey through an email and were asked for their participation in the study. This email gave them information regarding the purpose, focus, and expectations of the study so that they would have the ability to opt out if they decided they didn't want their teachers to participate. Those schools not wishing to participate were asked to reply so that they would be placed on a list of schools not wanting to participate. Those that did not reply to opt out of the survey were then e-mailed a password along with the link to the online questionnaire so that they could forward the survey to their teaching staff.

Teachers were given two months to respond to the survey and then the online questionnaire would be taken offline. All of the responses were collected in the Microsoft Access database and would be made available for immediate analysis. Since the questionnaire enabled teachers to rate their levels of satisfaction for each question, levels of satisfaction/dissatisfaction for each question were able to be averaged to get an overall percent of satisfaction for that question. The database also allows teachers to be grouped together based upon different characteristics (undergraduate degree, experience, certification, etc) and observe if there are any characteristics or patterns in satisfaction/dissatisfaction.

## RESULTS

**Overall Results:** At the end of the teacher survey period, 178 total teachers had responded to the survey. 19 of these teachers did not identify the county in which they taught. The geographical distribution of those teachers from across the state can be found in Figure 2.

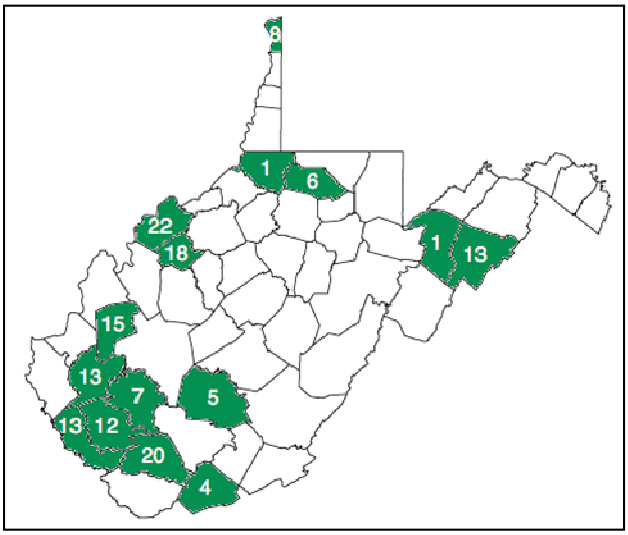


***Figure 2**: West Virginia counties and the number of teachers from those counties that responded to the survey.*

Out of the total 178 teachers responding, 160 of those teachers had provided valid responses. These were referred to as valid responses because they had submitted all of the required data that enabled them to be eligible and included in the study. Of the 160 valid responses approximately one-third of them were male and the remaining two-thirds were female. Responses to the variables were used to identify trends in the data collected and comparisons were made between all valid responses, STEM (Science, Technology, Engineering, and Mathematics) teachers, and biology teachers.

**Percent Leaving Before Retirement:** In the survey, teachers indicated whether or not they intended to leave the teaching profession before they were eligible for retirement. These responses were compared to other information such as undergraduate degree, method of obtaining certificate, years teaching, if teaching was their primary goal and other information. In comparing undergraduate degrees

and leaving before retirement, teachers were placed into categories of those that had obtained an undergraduate degree in that discipline or those that had obtained an undergraduate *educational* degree in that discipline. For example, biology teachers have been categorized into two groups: teachers that had received an undergraduate degree in biological science (BS) and those that had received an undergraduate degree in biology education (BA).

Looking at biology teachers that are leaving before retirement, 75% of teachers with an undergraduate degree in biology education were not leaving the profession before retirement while 25% of them were leaving before retirement. However, 83% of teachers that had obtained an undergraduate degree in biological science (referred to as biology majors) were not leaving before they retired whereas 17% of these teachers were leaving before retirement. When biology majors and biology education majors are analyzed statistically with a t-test, the significance is only shown to have a p-value of 0.0532 which is close, but technically not scientifically significant (given that a p-value = 5% or less be considered statistically significant). See Figure 3.

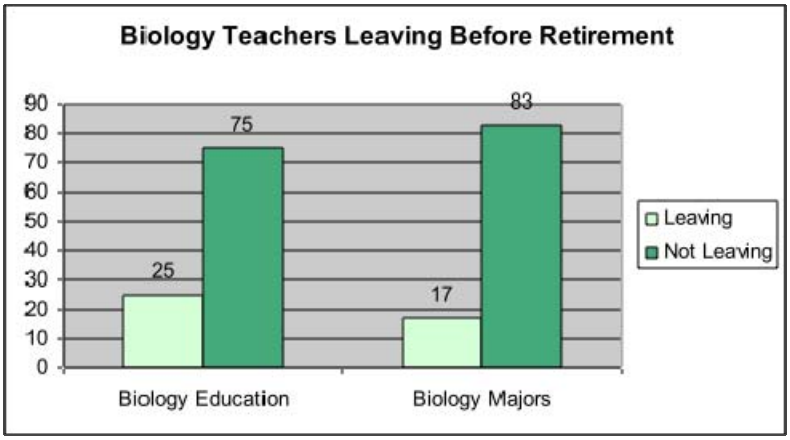


**Figure 3:** *Percent of teachers leaving and those not leaving before retirement between Biology Education majors and Biology majors.( p-value = .0532 Biology Education to Biology Majors).*

Teachers of general science, technology, engineering and mathematics (STEM) were compared using the same technique. 80% of teachers with an undergraduate degree in STEM education were not

leaving the profession before retirement while 20% of them were leaving before retirement. On the other hand, 86% of teachers that had obtained an undergraduate degree in a STEM major were not leaving before they retired whereas 14% of these teachers were leaving before retirement. Having an undergraduate major degree in a STEM discipline decreased the likelihood of the teacher leaving the profession before retirement by 6%. Again, even though the trend in the data suggests that having the undergraduate degree in a STEM content area decreases your chance of leaving the profession before retirement, it is still not statistically significant. The statistical analysis of the comparison STEM teachers yields a p-value of 0.0798 which is also insignificant. (See Figure 4).

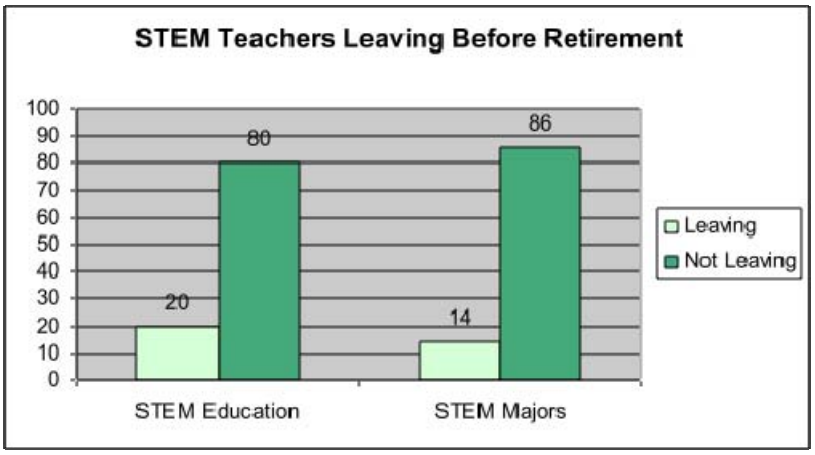


**Figure 4:** *Percent of teachers leaving and those not leaving before retirement between STEM Education and STEM majors. (p-value = .0798 STEM Education to STEM Majors)*

Among all valid responses, the total number of teachers indicating that they were leaving before retirement was 20%. This figure was compared to biology and STEM undergraduate majors that reported that they were leaving before retirement. Both biology and STEM undergraduate majors had lower percentages of teachers leaving the profession before retirement than the average for all teachers. See Figure 5.

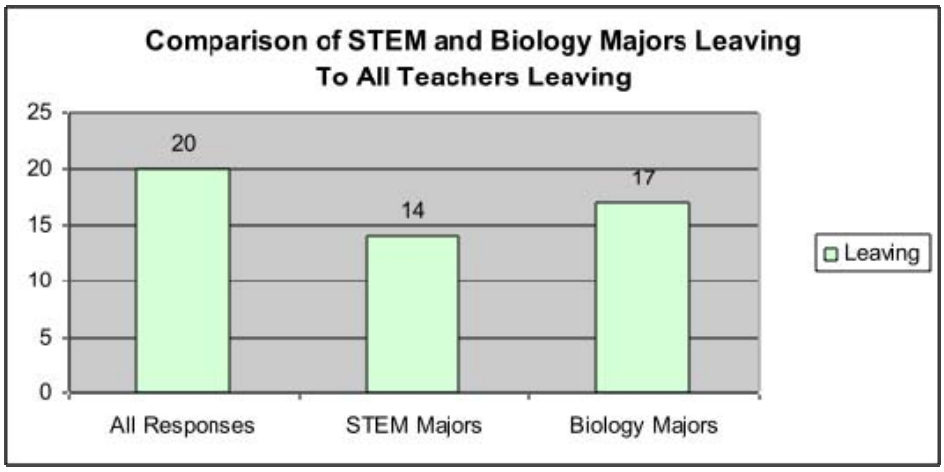


**Figure 5:** *Percent of teachers leaving before retirement between STEM and Biology Majors compared to all teachers that plan to leave before retirement. (p-value=.1308 STEM Majors to Biology Majors).*

The total number of teachers indicating that they were leaving before retirement was also compared to biology and STEM undergraduate education majors. Biology education majors leaving before retirement were 5% higher than all teachers leaving. STEM undergraduate education majors had the same percentage of teachers leaving the profession before retirement as all teachers at 20%. See Figure 6.

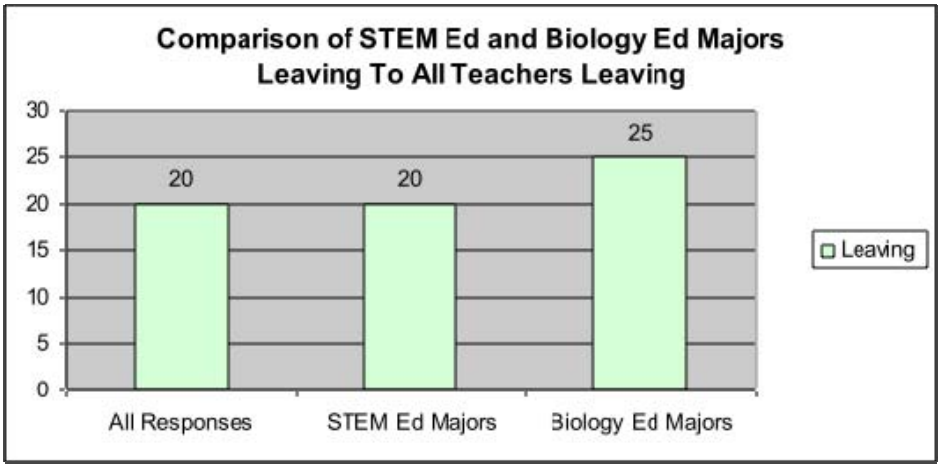


**Figure 6:** *Percent of teachers leaving before retirement between STEM and Biology Education Majors compared to all teachers that plan to leave before retirement. p-value=.0944(STEM Ed Majors to Biology Ed Majors).*

**Opportunities for Professional Advancement:** The items within this section of the survey were all items that dealt with opportunities for teachers to advance themselves in the professional teaching community through ways of earning continuing education credits, time for professional leave, as well as salary level. As Figure 7 shows, those responding as having an undergraduate degree in biology showed a greater satisfaction with their teaching profession when compared to STEM teachers and all valid responses in the category of professional advancement. However, biology majors do not show a higher satisfaction level when it comes to salary level.

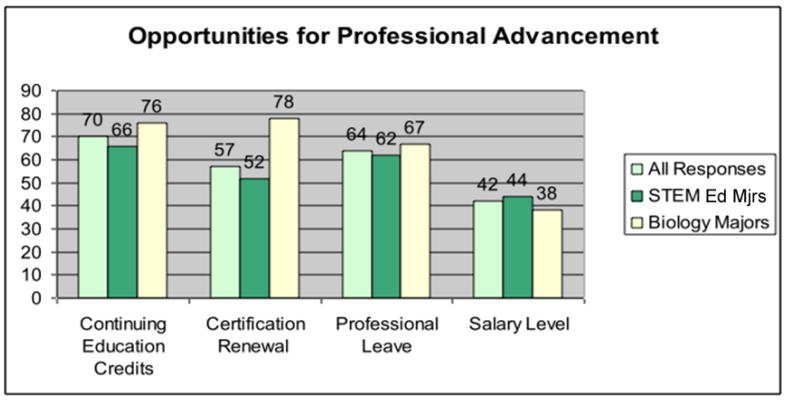


***Figure 7:*** *Comparison of percent of maximum satisfaction between All Responses, STEM education majors, and Biology majors in their opportunities for professional advancements.*

**p-values for Figure 7 between STEM Ed Majors and Biology Majors**

| | |
|---|---|
| Continuing Education | .0372 |
| Certification Renewal | .00007 |
| Professional Leave | .0896 |
| Salary Level | .0790 |

**Valued as Professional Educator:**

Teachers were also asked to rate their levels of satisfaction regarding how parents and students value education and value teachers. Illustrated in Figure 8, among all responses, 64% of teachers agreed that parents value them as a teacher. Amongst STEM teachers, there was a 67% response agreeing that parents value teachers. Those teachers who had indicated having an undergraduate degree in biological

science gave a higher percentage at 73% of maximum satisfaction in response to being valued as a teacher. Likewise, undergraduate biology majors also said that they were more satisfied when it comes to how parents value education.

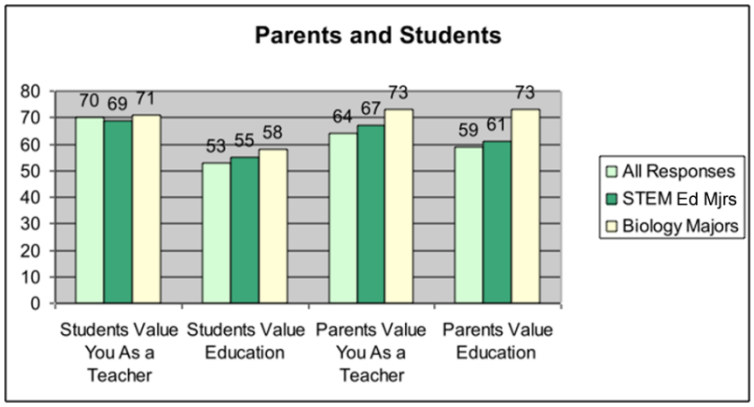


**Figure 8:** ***C****omparison of percent of maximum satisfaction between All Responses, STEM education majors, and Biology majors in how parents and students view them as a teacher and how parents and students value education.*

**p-values for Figure 8 between STEM Ed Majors and Biology Majors**

| | |
|---|---|
| Students value you as a teacher | .1169 |
| Students value education | .1035 |
| Parents value you as a teacher | .0802 |
| Parents value education | .0237 |

## DISCUSSION:

This survey intended to identify trends among West Virginia biology, math, and science teachers. The research also intended to determine whether or not these trends could be contributing to the loss and absence of highly qualified science and math teachers. It should be noted that the amount of data collected was large. Not only were there a significant number of responders, but the survey itself contained many questions and different variables that still need to be analyzed at a future time before a more complete picture of West Virginia science and math teacher attrition can be determined. Nonetheless, there were still some noticeable trends discovered within the selected variables that were examined in this study.

Before getting started, the paths to West Virginia teacher certification should be clarified. The website, teachwv.com, lists several ways one can become a fully certified teacher in West Virginia. In this study, only two routes of certification were examined: Teachers that had an undergraduate education degree with specialization and those that had an undergraduate major degree (BS in Biology or STEM) all from an accredited higher education institution. According to the WVDE and TeachWV website, those teachers obtaining an undergraduate degree in education must have completed an institution of higher education's state approved program which includes the recommendation of the designated official at that institution. In addition to obtaining a degree in education, he or she must complete all state required Praxis exams and meet the general requirements of teacher licensure. In an alternate route to certification, an individual that possesses the minimum of a bachelor's degree with a minimum overall 2.5 GPA from a regionally accredited institution of higher education, then he or she is eligible for certification and may be offered employment by a West Virginia county school district. In addition, he or she must meet the general requirements for teacher licensure and complete 18 semester hours of coursework in the areas of student assessment, development and learning, curriculum, classroom management, and other education courses. Of these 18 hours, 3 must contain instruction on diversity and special education. Lastly, he or she must then complete all state required Praxis exams.

The comparisons between teachers that have an undergraduate major degree and those teachers having an undergraduate education degree yielded interesting results. Data suggests that having an undergraduate degree in the content area being taught seems to increase the likelihood of the teacher staying in the profession than if the teacher had obtained an undergraduate education degree. The data shows that 8% fewer biology undergraduate majors are leaving when compared to undergraduate biology education majors (Figure 3).

Nevertheless, the trend in the data shown in Figures 3 through 6 does suggest that there is some trend in having an undergraduate degree and staying with the profession. However, the number of teachers having an undergraduate degree in content area being studied was much smaller compared to the number of undergraduate education major teachers. Had the number of teachers with undergraduate majors been relatively close to the number of teachers that had an undergraduate education degree, then the data might have appeared more significant with statistical analysis.

Although the previous section of the results doesn't indicate a *reason* that biology, math, and science teachers are leaving the profession, it does tell us that there might be some factor that exists between those teachers that received different college preparation and their desire to stay with the profession. It also raises many questions as to what could possibly be happening between these two different groups. What are the major differences between obtaining a content degree and an education degree? Do undergraduate biology majors have trouble finding jobs available after graduating and therefore fall back to teaching? Further research needs to be made into the relationship between undergraduate degrees and the ability of teachers to want to stay within the profession. For future study, the data within the teacher satisfaction survey could be used to identify any relationships that might exist between obtaining an undergraduate degree and continuing to stay with the teaching profession.

In the previous section of the results, teachers only indicated that they were leaving or not leaving before retirement and didn't list a reason. However, every teacher that completed the survey also

rated their levels of satisfaction for various categories. After calculating the maximum amount satisfaction for these categories, undergraduate biology majors showed a slightly higher average for each item in the category when compared to STEM education majors and all valid responses. In the category of Opportunity for Professional Advancement, all undergraduate biology majors indicated higher levels of satisfaction (except for salary) when compared to STEM education majors and all responses (see Figure 7). The items in this category were also statistically analyzed and even though most showed an increase in satisfaction, they were found to be insignificant. Continuing Education credits and Certification Renewal showed a significant difference of having maximum satisfaction and having an undergraduate major in biology. In regards to salary, it seems to be the same across the board in dissatisfaction. In the category of Valued as a Professional Educator, undergraduate biology majors indicated higher levels of satisfaction in all four items. The only item that was found to be significant was biology undergraduates that were highly satisfied with how parents viewed them as educators. Again, however, one must take into consideration that the number of teachers having an undergraduate degree in content area being studied was much smaller compared to the number of undergraduate education major teachers and this could affect the statistical significance for these results.

Within the several factors that were selected by this study to determine teacher satisfaction with the profession, it is unclear what teachers like or dislike the most. Even when limiting the scope of the comparison to undergraduate majors and undergraduate education majors, there was no significant *factor* that clearly caused more teachers to leave the profession than others. Having your undergraduate degree and becoming a teacher did seem to slow retention before retirement yet this correlation was shown not to be statistically significant. However, just because this association isn't significant doesn't negate the fact that the *trend* in the data does seem to show some difference in teacher attrition and undergraduate teacher preparation. Currently, the most common way for a secondary math, science, or biology undergraduate to become a certified educator is to enroll in a teacher preparation program such

as at a college or university to receive a degree that will make them eligible to be a teacher of that content area. Should the trends about undergraduate content degree teachers turn out to be statistically significant in future studies, it could influence the avenues in which we direct prospective teachers through a secondary education program. Instead of teachers only receiving a secondary education degree (BA in Biology Education, BA in Math Education), by allowing students to receive a double major in their content degree and in education, the retention rates of teachers may be increased.

## APPENDIX A: ONLINE TEACHER SURVEY

This section contains the text version of the web based teacher assessment that was used to survey the West Virginia teachers that chose to participate in this study:

**Teacher Survey**

Please enter the password below.

Submit

The password is incorrect! Please enter the correct password below.

Submit

---

Dear Fellow Educator,

My name is Seth Perry and I am currently doing research with Dr. Nicki LoCascio at Marshall University in the area of teacher satisfaction and the numbers of teachers leaving the profession. Nationwide research shows that fifty percent (50%) of all incoming teachers choose to leave the job after five years. We are interested in finding the factors West Virginia teachers consider most important in deciding to leave the profession, and what preventative measures can be implemented to keep current teachers in the classroom. Research will be conducted by surveying current and exiting West Virginia teachers using the following form to determine the overall satisfaction with the profession and comparing teacher disciplines. The problem with teacher turnover is that we have more teachers leaving than entering. Like a bucket full of holes, it is constantly losing water even though it is constantly being filled up. In the same way, the greatest challenge to teacher turnover is discovering the dissatisfaction of current teachers and stopping the leak by keeping them in the profession. We hope that you will consider being involved in this study by taking the following two-three minute survey. Your contribution is greatly appreciated! This is a strictly anonymous and confidential survey.

Your replies will be anonymous, so do not put your name anywhere on the form. There are no known risks involved with this study. Participation is completely voluntary and there will be no penalty or loss of benefits if you choose to not participate in this research study or to withdraw. If you have any questions concerning your rights as a research participant you may contact the Marshall University Office of Research Integrity at (304) 696-4303.

By completing and submitting this survey you are also confirming that you are **18** years of age or older.


Gender: ☐ male ☐ female

How long have you been teaching? 0 years

What was your undergraduate major?

What was your teaching specialization?

Method of certification? ☐ RESA ☐ Bachelor's ☐ MAT ☐ Post Baccalaureate

Highest received degree: ☐ None ☐ Bachelor's ☐ Master's ☐ Doctorate

When you were hired to teach were you with certification

Was teaching your primary goal? ☐ Yes ☐ No

Did you participate in new teacher mentoring program? ☐ Yes ☐ No

If yes was it helpful? N/A

Do you intend to leave teaching before retirement eligibility? ☐ Yes ☐ No

If yes, in how many years do you intend to retire? N/A

☐

**Please rate your satisfaction with the following:**

**Administrative Support**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Principal/Vice-Principal | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Department Chair | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Counselors | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| County Administration | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Effective School Discipline | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Physical Setting**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Adequate Teaching Space | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Classroom Conditions (cleanliness, design) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| School Conditions (upkeep, repair design) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Teachers' Facilities (lounges, restrooms) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Teacher Resources**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| New Teacher Mentoring Program | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Instructional Technology | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Sufficient Library Resources | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Secretarial/Clerical | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Discipline Specific Materials (teaching aids) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Laboratory Equipment | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Opportunities for Professional Advancement**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Continuing Education Credits | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Certification Renewal | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Professional Leave | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Salary Level | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Peers**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Staff within School (all faculty) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Staff within Department | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Parents and Students**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Students value you as a teacher | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Students value education | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Parents value you as a teacher | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Parents value education | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Educational Background**

| | N/A | None | A Little | Moderate | Very | Very Much |
|---|---|---|---|---|---|---|
| Quality of General Education Courses | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Number of General Education Courses | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Quality of Specialization Courses | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Number of Specialization Courses | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

Please enter any additional comments.

Please enter where you teach (state and county) to ensure accuracy of our data.

Submit Form Reset Form

---

**LoCascio/Perry.**



**Revised:**

# APPENDIX B: TEACHER SURVEY DATA

| ID | Gender | YrsTeaching | UnderGradMajor | Specialization |
|---|---|---|---|---|
| 8 | | 6 | Gen. Science7-12/Physical Ed. 7-12 | 9th Grade Science |
| 9 | female | 6 | Secondary Education 7 - 12 | Biology / General Science |
| 10 | male | 1 | Mathematics | Mathematics |
| 11 | male | 6 | Education | Chemistry, Physics, General Science |
| 12 | female | 3 | Elem & Special Education | Elementary & Sp. Ed. LD/BD/MI |
| 13 | male | 6 | Education | Social Studies 5-12 |
| 14 | female | 3 | Elem & Special Education | Elementary & Sp. Ed. LD/BD/MI |
| 15 | female | 6 | education | English |
| 16 | female | 6 | Education | Social Studies, Language Arts |
| 17 | male | 2 | Agriculture and Environmental Education | Agriculture |
| 18 | female | 6 | Education Elementary | SLD, MR K-!2 |
| 19 | male | 6 | Social Studies Education 5-12 | Social Studies 5-12 |
| 20 | female | 6 | ba math comp | 7 - 12 |
| 21 | female | 6 | K-8 Multi Subjects | |
| 22 | male | 6 | Education | Mathematics 5-8, Mathematics 5-12, Elementary Ed K |
| 23 | female | 6 | EDUCATION | BUSINESS--SECRETARIAL STUDIES, HOME ECONOMICS |
| 24 | male | 6 | Secondary Education | Biology |
| 25 | male | 6 | PE K-12 / HE K-12 | Health 10 |
| 26 | female | 6 | library science k-12 | elementary education |
| 27 | female | 6 | Secondary Education | English |
| 28 | female | 6 | secondary education | secretarial studies and safety |
| 29 | female | 6 | Health and Physical Education K-12 | |
| 30 | male | 6 | Education | Math 5-12 and General Sci. 5-12 |
| 31 | female | 6 | Mathematics | Mathematics 7-12 |
| 32 | male | 6 | Physical Education-Health | same |
| 33 | female | 6 | special education | mathematics |
| 34 | female | 6 | Music Ed | Band |
| 35 | female | 6 | General Science & Biology | Biology / General Science |
| 36 | female | 6 | Business Education Comprehensive | Business and Counseling |
| 37 | female | 6 | education | English |
| 38 | female | 6 | art k-12 | art |
| 39 | female | 6 | Psychology | Reading, English/Language Arts, Elementary Ed |
| 40 | male | 6 | Music Ed | K-12 Music |
| 41 | female | 1 | English and Spanish (Double Major) | English/Language Arts and Spanish 5-12 (currently |
| 42 | female | 6 | Multi Subject K/8 | Special Education |
| 43 | female | 6 | education | chemistry and biology |
| 44 | female | 6 | English | English 7 - Adult |
| 45 | female | 6 | mathematics | mathematics |
| 46 | female | 6 | Business Education | Comprehensive 7-12 |
| 47 | female | 6 | Language Arts | English |
| 48 | female | 6 | Individual and Family Studies | Vocational Home Economics |
| 49 | male | 6 | Education | Social Studies, physical education, safety ed. |
| 50 | female | 6 | Computers | Computers-Business |
| 51 | male | 6 | Secondary Education | Mathematics |
| 52 | female | 6 | Elem. 1-6 MR K-12 | |
| 53 | male | 6 | History | Social Studies |
| 54 | female | 6 | elementary ed | Autism/BD |
| 55 | female | 1 | history | history |
| 56 | male | 6 | Secondary Education | Business Principles 7-12, Math 7-9, Marketing 7-12 |
| 57 | male | 6 | pe | ss |
| 58 | male | 5 | BA in Edu | Social Studies |
| 59 | | 6 | physical education-mathmatics | math |
| 60 | female | 6 | Marketing | Special Education k-12 |
| 61 | female | 5 | Elementary Ed. | Reading Ed. and Gifted Ed. |
| 62 | female | 6 | Elementary/Special Education | MI |
| 63 | female | 6 | Social Studies Education | Social Studies |
| 64 | male | 1 | secondary education | social studies |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | |
|---|---|---|---|---|
| 65 | | 6 | Home economicis | home economics |
| 66 | male | 5 | multi subjects special ed | special ed |
| 67 | male | 6 | Music Education K-12 | Music |
| 68 | male | 6 | education | math/science |
| 69 | female | 4 | education | mathematics and science |
| 70 | female | 6 | Physical Education, Health, and English | K-12 |
| 71 | female | 6 | Business/Home Ec | Business Ed/Vocational Home Ec |
| 72 | male | 6 | Secondary Education - Math | Math (Grades 7 - 12) |
| 73 | female | 6 | Business Education | Business 5-12 |
| 74 | male | 1 | Social Studies and Special Education 5-12 | Social Studies and Special Education 5-12 |
| 75 | male | 6 | Physical Education/Math 7-12 | |
| 76 | male | 6 | BA in education | chemistry/physics |
| 77 | male | 2 | Agricultural and Environmental Education | Agriculture Science |
| 78 | female | 6 | health and physical education | health and physical education |
| 79 | female | 6 | Chemistry | Chemistry & Math |
| 80 | female | 6 | English/Oral Communications | English 7-12 |
| 81 | female | 6 | French & Speech | French & Speech |
| 82 | female | 6 | Spanish/English/Art | Spanish/English |
| 83 | female | 6 | elem ed | |
| 84 | female | 3 | Language Arts Education | Language Arts |
| 85 | male | 6 | Biology | Biology |
| 86 | female | 6 | soc. st. education | soc. st. then mi, ld, bd MA +70 |
| 87 | male | 6 | Social Studies 5-12 | |
| 88 | male | 1 | English Education | English Education 5-12 |
| 89 | male | 6 | Comprehensive History 7-12 | |
| 90 | male | 6 | education | social studies/English 5-12 |
| 91 | female | 6 | Speech | Special Education |
| 92 | female | 6 | Multi-Subjects k-8 | LD MI BD k-12 |
| 93 | male | 6 | Physical Education/Health/Driver Edcuation | (same as above) |
| 94 | male | 6 | Social Studies, Driver Education | Driver Education |
| 95 | male | 6 | Social Studies | SocialStudies |
| 96 | | 6 | chemistry education | chemistry & biology |
| 97 | female | 6 | world languages | Latin |
| 98 | female | 6 | Secondary Education | mathematics |
| 99 | female | 6 | history | english |
| 100 | | 6 | education | math |
| 101 | female | 5 | Biology | Secondary Education Science |
| 102 | male | 5 | BS Biology/Chemistry | Physics/Biology |
| 103 | female | 3 | Education | Spanish |
| 104 | female | 3 | Education | Spanish |
| 105 | female | 1 | Biology | |
| 106 | female | 6 | Home Ec and English | Family Consumer Science, English |
| 107 | female | 6 | Elementary education | Multi-subject k-8 |
| 108 | female | 6 | Library Science and English | English |
| 109 | female | 6 | BA Music Education K-12 | Vocal Music |
| 110 | female | 6 | English | English |
| 111 | female | 1 | secondary education | mathematics |
| 112 | female | 6 | education | biology, general science, chemistry/physics |
| 113 | female | 6 | secondary education | Biology, Chemistry, General Science |
| 114 | male | 6 | Secondary Education | Biological Science/General Science |
| 115 | female | 6 | Mathematics and English | Mathematics,English |
| 116 | female | 6 | home economics and sp ed | home economics |
| 117 | female | 6 | math and general science | math and general science |
| 118 | female | 6 | Fine Arts | Visual Arts |
| 119 | female | 5 | Business Education | Business Education/Accounting, Marketing, Manageme |
| 120 | female | 5 | Spanish | |
| 121 | male | 0 | Education | Social Studies 5-12 |
| 122 | male | 6 | elem. multi-sub5-8 | spec. ed |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | |
|---|---|---|---|---|
| 123 | | 6 | english | english |
| 124 | female | 6 | sec ed | math 5-12 |
| 125 | | 6 | Early Elem. Ed | Special Education K-12 |
| 126 | female | 6 | Art Education (K-12) | Visual Art |
| 127 | female | 6 | Physical Education/Health | Physical Education/Health |
| 128 | male | 6 | Education | Computer Science |
| 130 | female | 6 | music k - 12 | instrumental music |
| 131 | | 6 | music | music |
| 132 | male | 4 | Secondary Education | Social Studies |
| 133 | | 6 | Education AND Biology | biology, chemisrty, general science |
| 134 | female | 6 | 7-12 Soc Studies 7-12 Phy. Ed. | Social Studies |
| 135 | female | 6 | Secondary Education | Comprehensive Social Studies 7-12 |
| 136 | female | 3 | Education and Nursing | Social Studies, Special Ed math, Biology, English, |
| 137 | female | 6 | elementary education | special education |
| 138 | male | 6 | Social Studies | Social Studies Comprehensive 7-12 |
| 139 | female | 6 | Biology/science | science |
| 140 | female | 6 | education | General Science 5-12 |
| 141 | female | 6 | Medical Technology | Chemistry, Physics, General Science |
| 142 | female | 6 | business | business comprehensive |
| 143 | male | 4 | Secondary Education | Business |
| 144 | male | 5 | History and English | English 5-12; Social St. 5-9; Multicategorical Spe |
| 145 | female | 6 | Library Media Education | LIbrary Media |
| 146 | female | 6 | Education | Math |
| 147 | female | 0 | Business and Management | Adult and Technical Education |
| 148 | male | 6 | Political Science | Guidance |
| 149 | female | 6 | secondary education | mathematics and general science |
| 150 | female | 6 | Biology | General Science |
| 151 | female | 1 | Elementary Education | Math & Special Ed |
| 152 | female | 6 | English | English |
| 153 | male | 6 | mathematics | mathematics |
| 154 | female | 6 | social studies 7-12 | elementary education 1-6 |
| 155 | female | 6 | journalism education/English 7-12 | same as well as spec. ed. later |
| 156 | | 6 | Elementary Education | Social Studies |
| 157 | female | 6 | Business Education Comprehensive | same |
| 158 | female | 6 | French | secondary |
| 159 | | 6 | B.S. in Education | Social Studies & Safety |
| 160 | male | 6 | Agriculture | Ag.Ed. |
| 161 | male | 6 | Social Studies | Social Studies |
| 162 | female | 6 | Biology | Biology/ Chemistry/ Gen Sci 5-12 |
| 163 | male | 6 | Psychology and Biology (2 Bachelors, Bio for Educa | General Science 5-12, Biology 9-12 |
| 164 | male | 6 | secondary education | two specializations: English & French |
| 165 | female | 6 | English, Psychology | English and German |
| 166 | male | 6 | PE/HLTH | PE/HLTH |
| 167 | female | 2 | Psychology | English 5-12 |
| 168 | female | 6 | secondary education | math and general science 7 - 12 |
| 169 | female | 6 | Math 5-12 | Math 5-12 |
| 170 | male | 1 | Music Ed. | Music Ed. Pre-K/Adult |
| 171 | female | 6 | Secondary Education | Mathematics 7-12 |
| 172 | female | 6 | special education | special education |
| 173 | female | 6 | Secondary Education --- Mathematics | Mathematics 7-12 |
| 174 | female | 6 | teaching | 5-12 Eglish/Language arts |
| 175 | female | 6 | English / Speech | English |
| 176 | male | 6 | biology, general science, and math | biology |
| 177 | male | 4 | Criminal Justice | Special Education |
| 178 | male | 6 | Secondary Education | Math/Gen. Science |
| 179 | female | 4 | Music Education | Band |
| 180 | female | 6 | math comp education | Math 7-12 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | |
|---|---|---|---|---|
| 181 | female | 6 | Elementary Classroom Teacher 1-8 | Library Science |
| 182 | female | 6 | English and Journalism | 7-12 |
| 183 | female | 6 | Secondary Education | Social Studies 7-12 |
| 184 | female | 6 | Math | Math 5-12 |
| 185 | female | 6 | Education | Social Studies, Language Arts, Spec Ed |

| ID | Certification | Degree | Hiring | Goal | Mentoring | Help | Leave | Retire | Principal | Chair | Counselors | County |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 1 | 2 | with certification | 0 | 0 | 1 | 0 | 3 | 4 | 4 | 1 | 2 |
| 9 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 3 | 3 | 2 |
| 10 | 3 | 1 | other | 1 | 1 | 1 | 1 | 0 | 4 | 5 | 1 | 2 |
| 11 | 1 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 4 | 4 | 3 | 3 |
| 12 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 0 | 2 | 3 | 1 | 2 |
| 13 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 1 | 2 | 2 |
| 14 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 0 | 2 | 3 | 1 | 2 |
| 15 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 3 |
| 16 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 4 | 0 | 2 | 1 |
| 17 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 3 | 4 | 4 | 2 | 4 |
| 18 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 4 | 5 | 3 |
| 19 | 1 | 1 | long term substitute | 0 | 0 | 1 | 1 | 4 | 3 | 5 | 4 | 1 |
| 20 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 3 | 4 | 4 | 3 | 2 |
| 21 | 1 | 2 | obtaining certification | 0 | 1 | N/A | 1 | 4 | 5 | 5 | 5 | 5 |
| 22 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 4 | 4 |
| 23 | 1 | 2 | obtaining certification | 0 | 1 | N/A | 1 | 0 | 5 | 0 | 4 | 4 |
| 24 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 4 | 5 | 5 | 5 | 2 |
| 25 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 5 | 4 | 2 |
| 26 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 5 | 5 | 5 | 5 |
| 27 | 1 | 2 | with certification | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 2 | 2 |
| 28 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 0 | 4 | 4 |
| 29 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 3 | 4 | 3 | 2 |
| 30 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 5 | 4 | 3 |
| 31 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 0 | 5 | 5 |
| 32 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 3 | 5 | 4 | 4 | 4 |
| 33 | 1 | 2 | long term substitute | 0 | 1 | N/A | 0 | 4 | 4 | 0 | 3 | 4 |
| 34 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | 5 | 5 | 3 |
| 35 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 3 | 2 | 1 |
| 36 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 1 | 5 | 3 |
| 37 | 1 | 1 | long term substitute | 0 | 1 | N/A | 0 | 2 | 2 | 1 | 3 | 1 |
| 38 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 4 | 5 | 0 | 5 | 3 |
| 39 | 3 | 2 | long term substitute | 1 | 1 | N/A | 0 | 2 | 4 | 3 | 5 | 2 |
| 40 | 1 | 2 | with certification | 0 | 1 | N/A | 0 | 4 | 2 | 5 | 1 | 1 |
| 41 | 2 | 2 | with certification | 0 | 0 | 0 | 0 | 4 | 4 | 5 | 3 | 4 |
| 42 | 2 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 4 | 3 |
| 43 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 0 | 4 | 5 | 5 | 1 |
| 44 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 2 | 3 | 5 | 3 | 3 |
| 45 | 1 | 2 | other | 1 | 1 | N/A | 1 | 0 | 2 | 4 | 2 | 2 |
| 46 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 2 | 5 |
| 47 | 2 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 1 | 5 | 3 | 1 |
| 48 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 0 | 3 | 4 | 2 | 2 |
| 49 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 4 | 5 | 5 | 5 | 3 |
| 50 | 1 | 1 | with certification | 1 | 1 | N/A | 0 | 4 | | | | |
| 51 | 3 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 4 | 1 | 4 |
| 52 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 4 | 3 | 4 |
| 53 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 2 | 3 | 1 |
| 54 | 3 | 2 | obtaining certification | 0 | 0 | 1 | 1 | 0 | 3 | 4 | 2 | 3 |
| 55 | 2 | 1 | long term substitute | 0 | 1 | N/A | 1 | 0 | 4 | 4 | 3 | 4 |
| 56 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 2 | 4 | 3 | 1 |
| 57 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 0 | 3 | 4 | 2 | 3 |
| 58 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 4 | 4 | 4 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 3 | 3 | 4 |
| 60 | 1 | 2 | obtaining certification | 1 | 1 | N/A | 1 | 0 | 4 | 3 | 3 | 2 |
| 61 | 3 | 2 | obtaining certification | 0 | 0 | 0 | 1 | 0 | 5 | 2 | 1 | 3 |
| 62 | 1 | 2 | with certification | 0 | 0 | N/A | 1 | 3 | 2 | 3 | 2 | 2 |
| 63 | 1 | 2 | with certification | 0 | 0 | 1 | 0 | 1 | 3 | 2 | 4 | 3 |
| 64 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 3 | 5 | 3 | 2 | 3 |
| 65 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 1 | 2 | 5 | 1 | 4 |
| 66 | 1 | 2 | long term substitute | 0 | 0 | 1 | 1 | 4 | 4 | 3 | 3 | 4 |
| 67 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 3 | 5 | 3 | 3 |
| 68 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 2 | 3 | 4 | 3 | 3 |
| 69 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 2 | 3 |
| 70 | 1 | 2 | obtaining certification | 0 | 1 | N/A | 1 | 4 | 4 | 4 | 4 | 4 |
| 71 | 1 | | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 0 | 3 | 2 |
| 72 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 5 | 3 |
| 73 | 1 | 1 | with certification | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 3 | 4 |
| 74 | 1 | 1 | substitute | 0 | 0 | N/A | 1 | 0 | 5 | 3 | 4 | 5 |
| 75 | 1 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 4 | 5 | 5 | 3 |
| 76 | 1 | 2 | with certification | 0 | 0 | 1 | 0 | 4 | 5 | 5 | 5 | 4 |
| 77 | 1 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 3 | 5 |
| 78 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 3 | 3 | 2 | 3 |
| 79 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 4 | 3 | 3 |
| 80 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 4 | 3 | 3 |
| 81 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 1 | 1 | 5 | 3 | 3 |
| 82 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 3 | 4 | 0 | 4 | 4 |
| 83 | 1 | 1 | long term substitute | 0 | 0 | 1 | 0 | 4 | 3 | 0 | 2 | 3 |
| 84 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 4 | 5 | 5 | 4 | 3 |
| 85 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 0 | 3 | 4 | 5 | 2 |
| 86 | 1 | 2 | with certification | 0 | 0 | 0 | 1 | 4 | 5 | 5 | 3 | 2 |
| 87 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | 4 | 4 | 3 |
| 88 | 1 | 1 | with certification | 1 | 0 | 0 | 0 | 2 | 4 | 3 | 4 | 5 |
| 89 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 0 | 0 | 5 |
| 90 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 91 | | 2 | with certification | 0 | 1 | N/A | | 3 | 3 | 5 | 4 | 3 |
| 92 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 4 | 3 | 3 | 4 |
| 93 | 3 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 3 | 2 | 2 | 3 |
| 94 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 1 | 5 | 5 | 5 | 5 |
| 95 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | | 5 | 5 |
| 96 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 1 | 4 | 2 | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 97 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 2 | 5 | 3 | 1 |
| 98 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 4 |
| 99 | 1 | 1 | with certification | 1 | 1 | N/A | 0 | 4 | 3 | 2 | 3 | 1 |
| 100 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 1 | 5 | 3 | 2 |
| 101 | 1 | 1 | obtaining certification | 1 | 0 | 0 | 1 | 0 | 3 | 1 | 1 | 3 |
| 102 | 2 | 1 | other | 1 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 |
| 103 | 1 | 2 | with certification | 0 | 0 | 0 | | 0 | 4 | 4 | 4 | 3 |
| 104 | 1 | 2 | with certification | 0 | 0 | 0 | | 0 | 4 | 4 | 4 | 3 |
| 105 | 2 | 2 | long term substitute | 1 | 1 | N/A | 1 | 0 | 4 | 5 | 5 | 1 |
| 106 | 1 | 2 | with certification | 1 | 0 | 1 | 1 | 3 | 3 | 0 | 0 | 1 |
| 107 | 1 | 1 | obtaining certification | 0 | 1 | N/A | 1 | 0 | 4 | 3 | 2 | 1 |
| 108 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 4 | 5 | 0 | 5 | 5 |
| 109 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | 4 | 3 | 2 |
| 110 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 1 | 4 | 4 | 2 | 2 |
| 111 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 4 | 5 | 4 | 3 |
| 112 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 0 | 3 | 3 | 3 | 3 |
| 113 | 1 | 2 | long term substitute | 0 | 1 | N/A | 1 | 0 | 5 | 4 | 2 | 3 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 114 | 1 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 4 | 5 | 3 | 4 |
| 115 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 4 | 4 | 4 | 3 | 3 |
| 116 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 0 | 2 | 3 |
| 117 | | | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 3 | 3 |
| 118 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 0 | 3 | 4 |
| 119 | 3 | 3 | with certification | 1 | 1 | N/A | 1 | 0 | 5 | 3 | 3 | 1 |
| 120 | | 1 | obtaining certification | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 5 | 4 |
| 121 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 5 | 5 |
| 122 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 4 | 2 | 3 | 3 | 2 |
| 123 | 1 | 1 | with certification | 0 | 1 | N/A | 0 | 3 | 3 | 3 | 2 | 2 |
| 124 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 4 | 3 | 5 | 1 | 3 |
| 125 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 4 | 2 |
| 126 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 2 |
| 127 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 0 | 3 | 3 |
| 128 | 1 | 2 | with certification | 0 | 0 | 0 | 0 | 3 | 2 | 4 | 4 | 5 |
| 130 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 5 |
| 131 | 2 | 2 | obtaining certification | 0 | 0 | 1 | 1 | 4 | 5 | 1 | 5 | 3 |
| 132 | 1 | 1 | obtaining certification | 0 | 1 | N/A | 1 | 0 | 4 | 4 | 4 | 4 |
| 133 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 3 | 3 | 2 |
| 134 | 1 | 2 | obtaining certification | 0 | 1 | N/A | 1 | 4 | 5 | 3 | 5 | 5 |
| 135 | 1 | 2 | with certification | 0 | 1 | N/A | | 0 | 5 | 5 | 5 | 4 |
| 136 | 1 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 2 |
| 137 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 3 | 3 | 3 |
| 138 | 1 | 1 | long term substitute | 0 | 1 | N/A | 0 | 2 | 4 | 4 | 4 | 3 |
| 139 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 5 |
| 140 | 3 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 3 | 2 | 3 |
| 141 | 3 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 3 | 5 |
| 142 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 4 | 5 | 0 | 3 | 3 |
| 143 | 1 | 1 | substitute | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 2 |
| 144 | 2 | 2 | obtaining certification | 0 | 0 | 1 | 1 | 0 | 3 | 5 | 3 | 3 |
| 145 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 0 | 3 | 3 |
| 146 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 3 | 3 | 3 | 2 | 3 |
| 147 | | 1 | substitute | 1 | 1 | N/A | 1 | 4 | 2 | 1 | 2 | 1 |
| 148 | 3 | 2 | with certification | 1 | 0 | 1 | 1 | 4 | 4 | 0 | 5 | 3 |
| 149 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 4 | 1 | 3 |
| 150 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 4 |
| 151 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 3 | 2 | 2 | 1 |
| 152 | 1 | 2 | with certification | 1 | 0 | 1 | 0 | 1 | 4 | 0 | 2 | 1 |
| 153 | 3 | 3 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 5 |
| 154 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 2 | 4 |
| 155 | 3 | 2 | other | 1 | 1 | N/A | 1 | 3 | 5 | 5 | 4 | 5 |
| 156 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 2 | 4 | 3 | 2 | 1 |
| 157 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 4 | 4 | 5 | 4 | 5 |
| 158 | 1 | 2 | with certification | 1 | 1 | N/A | 1 | 0 | 3 | 0 | 4 | 2 |
| 159 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 3 | 5 | 4 |
| 160 | 3 | 2 | obtaining certification | 0 | 0 | 1 | 1 | 4 | 5 | 3 | 3 | 1 |
| 161 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 2 | 2 | 3 |
| 162 | 1 | 2 | with certification | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 2 | 4 |
| 163 | 1 | 1 | with certification | 1 | 0 | 0 | 0 | 3 | 3 | 4 | 3 | 2 |
| 164 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 3 | 4 | 2 |
| 165 | 3 | 2 | with certification | 0 | 1 | 0 | | 1 | 3 | 0 | 1 | 1 |
| 166 | 1 | 1 | with certification | 0 | 0 | 0 | 1 | 0 | 4 | 5 | 2 | 2 |
| 167 | 2 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 5 | 5 |
| 168 | 1 | 2 | with certification | 0 | 1 | N/A | 0 | 4 | 5 | 5 | 5 | 5 |
| 169 | 1 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 3 | 5 |
| 170 | 1 | 1 | with certification | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 4 | 2 |
| 171 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 4 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 172 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 4 | 4 | 4 | 4 |
| 173 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 2 | 3 | 0 | 3 | 3 |
| 174 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 5 |
| 175 | 1 | 2 | with certification | 0 | 1 | N/A | 0 | 1 | 4 | 4 | 3 | 1 |
| 176 | 1 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 2 | 3 | 4 |
| 177 | 1 | 1 | obtaining certification | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 2 | 4 |
| 178 | 1 | 2 | with certification | 0 | 0 | 0 | 1 | 0 | 5 | 4 | 3 | 4 |
| 179 | 1 | 1 | with certification | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 1 |
| 180 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 4 | 4 | 5 | 3 | 3 |
| 181 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 3 | 2 | 2 |
| 182 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 4 |
| 183 | 1 | 2 | with certification | 0 | 1 | N/A | 1 | 0 | 3 | 2 | 5 | 2 |
| 184 | 1 | 1 | with certification | 0 | 1 | N/A | 1 | 0 | 5 | 5 | 5 | 4 |
| 185 | 1 | 2 | with certification | 0 | 1 | N/A | | 3 | 4 | 0 | 2 | 2 |

| ID | Space | Classroom | School | Lounge | Mentor | IT | Library | Clerical | Aids | Equipment | Credits | Renewal | Leave2 | Salary | Staff |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 2 | 4 | 3 | 3 | 3 | 2 | 1 | 3 |
| 9 | 2 | 4 | 3 | 3 | 3 | 5 | 2 | 4 | 4 | 3 | 0 | 0 | 3 | 2 | 4 |
| 10 | 1 | 2 | 2 | 2 | 1 | 4 | 1 | 4 | 1 | 3 | 2 | 2 | 1 | 1 | 3 |
| 11 | 4 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 |
| 12 | 1 | 4 | 5 | 5 | 1 | 5 | 2 | 3 | 4 | 3 | 3 | 3 | 3 | 1 | |
| 13 | 4 | 4 | 4 | 4 | 4 | 5 | 3 | 4 | 3 | 0 | 3 | 3 | 3 | 2 | 3 |
| 14 | 1 | 4 | 5 | 5 | 1 | 5 | 2 | 3 | 4 | 3 | 3 | 3 | 3 | 1 | |
| 15 | 3 | 3 | 4 | 4 | 4 | 2 | 2 | 4 | 4 | 2 | 4 | 4 | 4 | 2 | 5 |
| 16 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | | | 4 | 0 | 0 | 1 | 4 |
| 17 | 5 | 5 | 5 | 5 | 2 | 4 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | |
| 18 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 19 | 3 | 2 | 2 | 1 | 1 | 5 | 5 | 5 | 3 | 0 | 3 | 4 | 1 | 1 | 3 |
| 20 | 1 | 3 | 1 | 2 | | 3 | 3 | 2 | 3 | 3 | 5 | 4 | 4 | 3 | 3 |
| 21 | 5 | 5 | 5 | 5 | 0 | 5 | 5 | 5 | 5 | 0 | 5 | 0 | 0 | 0 | 5 |
| 22 | 5 | 5 | 5 | 4 | 4 | 5 | 3 | 4 | 4 | 5 | 3 | 3 | 3 | 2 | 4 |
| 23 | 5 | 5 | 5 | 5 | 0 | 4 | 5 | 5 | 5 | 0 | 4 | 4 | 4 | 1 | |
| 24 | 5 | 3 | 2 | 3 | 4 | 3 | 3 | 5 | 4 | 3 | 5 | 5 | 4 | 1 | 4 |
| 25 | 5 | 5 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 3 | 5 |
| 26 | 5 | 2 | 2 | 2 | 0 | 3 | 4 | 0 | 0 | 0 | 5 | 5 | 5 | 2 | 5 |
| 27 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 2 |
| 28 | 4 | 5 | 5 | 5 | 0 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 |
| 29 | 4 | 4 | 5 | 5 | 0 | 4 | 3 | 4 | 2 | 0 | 3 | 3 | 3 | 1 | 3 |
| 30 | 5 | 5 | 5 | 5 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| 31 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 1 | 5 |
| 32 | 4 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |
| 33 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 5 | 4 | 3 | 2 | 4 | 0 | 2 | 4 |
| 34 | 5 | 5 | 5 | 5 | 0 | 2 | 3 | 5 | 4 | 0 | 4 | 4 | 4 | 1 | 4 |
| 35 | 3 | 1 | 1 | 1 | | 2 | 2 | 4 | 3 | 2 | 3 | 4 | 5 | 2 | 4 |
| 36 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 2 | 2 |
| 37 | 4 | 4 | 4 | 5 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 1 | 2 | 2 | 1 |
| 38 | 3 | 1 | 3 | 3 | 0 | 4 | 3 | 3 | 2 | 1 | 4 | 4 | 0 | 1 | 3 |
| 39 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 4 | 2 | 2 | 5 | 5 | 2 | 1 | 3 |
| 40 | 5 | 5 | 4 | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 4 | 2 | 5 |
| 41 | 5 | 4 | 5 | 5 | 4 | 3 | 2 | 5 | 2 | 2 | 4 | 4 | 3 | 1 | 4 |
| 42 | 3 | 4 | 5 | 3 | 4 | 3 | 3 | 5 | 4 | 3 | 4 | 4 | 5 | 3 | 4 |
| 43 | 3 | 2 | 2 | 2 | 0 | 3 | 3 | 5 | 4 | 5 | 2 | 2 | 3 | 1 | 3 |
| 44 | 3 | 3 | 3 | 2 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 2 | 4 |
| 45 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| 46 | 3 | 3 | 3 | 3 | 0 | 3 | 4 | 0 | 0 | 3 | 5 | 3 | 5 | 3 | 5 |
| 47 | 3 | 2 | 2 | 1 | 4 | 4 | 4 | 4 | 5 | 1 | 5 | 3 | 5 | 2 | 4 |
| 48 | 2 | 2 | 3 | 1 | 0 | 2 | 3 | 3 | 1 | 3 | 4 | 0 | 3 | 2 | 3 |
| 49 | 5 | 5 | 3 | 3 | 4 | 4 | 3 | 5 | 4 | 3 | 4 | 4 | 4 | 3 | 5 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 51 | 3 | 3 | 2 | 1 | 0 | 3 | 4 | 4 | 5 | 4 | 2 | 0 | 2 | 2 | 4 |
| 52 | 3 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 4 |
| 53 | 3 | 3 | 3 | 3 | 0 | 4 | 3 | 3 | 2 | 0 | 2 | 2 | 3 | 1 | 4 |
| 54 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 4 | 4 | 4 | 3 | 3 |
| 55 | 5 | 4 | 4 | 4 | 0 | 4 | 3 | 4 | 4 | 0 | 4 | 4 | 0 | 2 | 5 |
| 56 | 3 | 3 | 3 | 1 | 0 | 2 | 4 | 3 | 3 | 3 | 1 | 0 | 4 | 2 | 4 |
| 57 | 3 | 4 | 4 | 3 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 2 | 2 | 2 |
| 58 | 5 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 1 | 4 |
| 59 | 5 | 4 | 5 | 4 | 0 | 3 | 0 | 4 | 3 | 0 | 4 | 4 | 0 | 0 | 3 |
| 60 | 5 | 5 | 5 | 4 | 0 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 1 | 5 |
| 61 | 1 | 2 | 3 | 2 | 4 | 5 | 4 | 4 | 3 | 0 | 4 | 2 | 4 | 3 | 3 |
| 62 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 4 |
| 63 | 3 | 3 | 3 | 2 | 1 | 4 | 3 | 4 | 3 | 3 | 5 | 4 | 4 | 2 | 4 |
| 64 | 4 | 3 | 3 | 3 | 2 | 1 | 3 | 5 | 3 | 3 | 4 | 4 | 4 | 1 | 4 |
| 65 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 0 | 0 | 1 | 2 |
| 66 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 2 | 3 |
| 67 | 5 | 2 | 4 | 3 | 0 | 3 | 4 | 4 | 4 | 0 | 3 | 3 | 4 | 3 | 3 |
| 68 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| 69 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 2 | 3 | 1 | 1 | 3 | 3 | 3 |
| 70 | 5 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 5 |
| 71 | 5 | 5 | 5 | 5 | 3 | 2 | 2 | 2 | 1 | 5 | 4 | 4 | 3 | 1 | 2 |
| 72 | 3 | 4 | 3 | 5 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 0 | 0 | 1 | 4 |
| 73 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 4 | 4 | 4 | 4 | 3 | 4 |
| 74 | 5 | 5 | 5 | 4 | 3 | 5 | 4 | 5 | 2 | 3 | 5 | 0 | 4 | 3 | 5 |
| 75 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | | | | | 4 |
| 76 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 1 | 5 |
| 77 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 4 | 4 | 5 | 3 | 4 |
| 78 | 4 | 3 | 2 | 0 | 0 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 5 | 3 | 3 |
| 79 | 3 | 3 | 4 | 4 | 0 | 2 | 3 | 2 | 2 | 3 | 3 | 0 | 2 | 2 | 4 |
| 80 | 3 | 5 | 5 | 2 | 0 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 1 | 5 |
| 81 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 0 | 2 | 2 | 3 | 2 | 2 |
| 82 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |
| 83 | 3 | 2 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 4 |
| 84 | 1 | 4 | 3 | 1 | 5 | 5 | 5 | 5 | 5 | 0 | 5 | 5 | 5 | 5 | 5 |
| 85 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 4 | 2 | 2 | 3 | 4 | 2 | 2 | 3 |
| 86 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 2 | 5 |
| 87 | 4 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 |
| 88 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 2 | 3 |
| 89 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 90 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 0 | 5 | 3 | | 2 | 3 |
| 91 | 5 | 4 | 5 | 3 | 0 | 4 | 3 | 3 | 3 | 0 | 3 | 0 | 2 | 2 | 4 |
| 92 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 0 | 0 | 4 | 4 | 4 | 2 | 4 |
| 93 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 3 |
| 94 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| 95 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 5 | 5 | 5 | 3 | 5 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | 3 | 4 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 4 | 2 | 2 | 4 |
| 97 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 0 | 0 | 2 | 3 |
| 98 | 4 | 4 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 0 | 5 | 3 | 5 |
| 99 | 3 | 1 | 3 | 2 | 1 | 4 | 1 | 4 | 3 | 0 | 2 | 2 | 1 | 1 | 3 |
| 100 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 |
| 101 | 4 | 2 | 1 | 2 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 1 | 2 |
| 102 | 4 | 4 | 4 | 4 | 3 | 3 | 1 | 4 | 1 | 5 | 3 | 3 | 4 | 1 | 4 |
| 103 | 3 | 2 | 2 | 4 | 3 | 3 | 0 | 3 | 0 | 2 | 2 | 0 | 4 | 2 | 4 |

# APPENDIX B: TEACHER SURVEY DATA

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 104 | 3 | 2 | 2 | 4 | 3 | 3 | 0 | 3 | 0 | 2 | 2 | 0 | 4 | 2 | 4 |
| 105 | 1 | 3 | 5 | 5 | 0 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 1 | 5 |
| 106 | 3 | 3 | 3 | 2 | 3 | 4 | 5 | 4 | 1 | 0 | 0 | 3 | 3 | 3 | 4 |
| 107 | 4 | 3 | 4 | 3 | 0 | 3 | 3 | 2 | 2 | 2 | 4 | 4 | 4 | 2 | 3 |
| 108 | 5 | 3 | 3 | 2 | 0 | 3 | 5 | 5 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |
| 109 | 5 | 3 | 3 | 2 | 3 | 5 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| 110 | 2 | 2 | 3 | 2 | 0 | 3 | 3 | 3 | 5 | 4 | 4 | 0 | 3 | 4 | 4 |
| 111 | 4 | 3 | 3 | 2 | 4 | 3 | 4 | 5 | 4 | 0 | 1 | 1 | 3 | 2 | 5 |
| 112 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 3 | 3 | 0 | 3 | 3 |
| 113 | 3 | 2 | 1 | 2 | 0 | 4 | 3 | 3 | 3 | 2 | 0 | 0 | 1 | 1 | 4 |
| 114 | 5 | 5 | 5 | 3 | 3 | 4 | 2 | 4 | 5 | 5 | 3 | 0 | 4 | 3 | 4 |
| 115 | 3 | 2 | 3 | 2 | 0 | 3 | 4 | 2 | 2 | 3 | 0 | 0 | 4 | 0 | 3 |
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| 160 | 3 | 2 | 1 | 1 | 2 | 4 | 4 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
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# APPENDIX B: TEACHER SURVEY DATA

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| ID | Department | Value1 | Value2 | Value3 | Value4 | QualityEd | NumberEd | QualitySpec | NumberSpec |
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# APPENDIX B: TEACHER SURVEY DATA

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| 43 | 5 | 4 | 4 | 3 | 3 | 2 | 4 | 4 | 4 |
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## APPENDIX B: TEACHER SURVEY DATA

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| 106 | 5 | 4 | 3 | 3 | 2 | 3 | 3 | 4 | 4 |
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# APPENDIX B: TEACHER SURVEY DATA

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## BIBLIOGRAPHY


Darling-Hammond, Linda, and Gary Sykes. "Wanted: A National Teacher Supply Policy for Education: The Right Way To Meet the "Highly Qualified Teacher"" Education Policy Analysis Archives 11(33) (2003): 1-57.

Flatt, Jennifer M. Stolpa. "Teacher Retention." Phi Kappa Phi Forum 86 (2006):3-5.

Froschauaer, Linda. "How Can We Attract Students to STEM Careers?" NSTA - National Science Teachers Association. 2 Nov. 2006. <http://www.nsta.org/publications/news/story.aspx?id=52862>

Futernick, Ken. "Study Examines Why Teachers Quit and What Can Be Done." District Administration 34 (2007): 16.

Hirsch, Eric. "Understanding the Results of the West Virginia Vision for Teaching and Learning (VITAL) Survey: Initial Findings." West Virginia Vision for Improving Teaching and Learning (WV VITAL). 10 June 2008. 01 Mar. 2009 <http://www.westvirginiavital.org/>.

Ingersoll, Richard M., and Bridget K. Curran. "NGA Center for Best Practices." National Governors Association. 20 July 2004. 15 Feb. 2009 <http://www.nga.org/portal/site/nga/menuitem.9123e83a1f6786440ddcbeeb501010a0/?vgnextoid=b9a5303cb0b32010VgnVCM1000001a01010aRCRD>. Web Publication

Ingersoll, Richard M., and Thomas M. Smith. "The Wrong Solution to the Teacher Shortage." Educational Leadership May (2003): 30-33.

Ingersoll, Richard M. "Is There a Shortage Among Mathematics and Science Teachers." Science Educator 12 (2003): 1-9.

Ingersoll, Richard M. "Understanding Supply and Demand Among Mathematics and Science Teachers." Teaching Science in the 21st Century (2006): 197-211.

Paine, Steven. West Virginia Education Association. 1 Oct. 2007. <http://www.wvea.org/shared/content_objects/pdf//nestelteachershortagereport.pdf>.

Pedhazue, Elazar and Liora Schmeklin. 1991. *Measurement, Design, and Analysis.* Hillsdale, New Jersey: Earlbaum.

Shen, Jianping. “Teacher Retention and Attrition in Public Schools: Evidence from SASS91” The Journal of Educational Research, 91(2) (1997): 81-88

Silverman, Fran. "Please stay: district leaders focus on hiring the best qualified teachers. But then what?" *The Free Library* 01 January 2006. 03 March 2010 <http://www.thefreelibrary.com/Please stay: district leaders focus on hiring the best qualified...-a0141091276>.