

Morale of Beginning Secondary Science Teachers:
A Comparative Analysis of Teacher Preparation Programs

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Abstract

This paper examines the morale of beginning secondary science teachers who attended one of three types of teacher preparation programs: 1) traditional undergraduate, 2) post-baccalaureate certification, or 3) alternative route to certification. One-hundred one secondary science teachers (grades 7-12) who were completing their second year in a Connecticut public middle or high school were surveyed to determine their levels of morale using the *Purdue Teacher Opinionnaire (PTO)*. Findings indicated that teachers trained via alternative route to certification were significantly less satisfied with their salary compared to those trained at traditional undergraduate programs. The socioeconomic status of the district in which the beginning teacher was employed was related to total morale and four of the ten morale factors measured on the *PTO*. As the socioeconomic rank of the employing district increased, so did morale. The results of this study have implications for public school administrators and institutions certified to prepare them, particularly in terms of how to recruit, select, and retain them in the teaching profession.

Key Words: job satisfaction, morale, beginning teacher, teacher preparation, teacher retention

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The supply of qualified science teachers has been an ongoing concern in the United States. A shortage of these teachers has developed over time through a combination of increasing student enrollments and teacher attrition. Since the early 1990's, secondary student enrollment has been gradually rising and this trend is projected to continue until 2016 (National Center for Education Statistics, 2008). As the secondary enrollment has been steadily increasing, so has the number of teachers retiring and leaving the profession (Ingersoll, 2004; National Commission on Teaching and America's Future, 2003; National Science Board, 2006). Recognizing this serious shortfall of qualified teachers in specific subjects, former President George W. Bush called for the recruitment of 30,000 new mathematics and science teachers (State of the Union, 2006).

Although the recruitment of additional math and science teachers is important, retaining presently employed teachers is also a priority. The Washington-based National Commission on Teaching and America's Future (2003) estimated that the teacher turnover rate is 17 percent. Unfortunately, beginning teachers in general have a much higher rate of attrition. The data suggested that after just three years, 29 percent of all beginning teachers have left teaching altogether. After five years, fully 39 percent have left teaching and the numbers for science teachers were slightly higher (Ingersoll, 2000).

The challenge to recruit, hire and retain teachers is greatest in the public schools of large cities, with urban turnover rates twice-national averages (Grossman, 2009). According to Murnane and Steele (2007), "The evidence is clear that urban school districts serving large concentrations of low-income students have trouble attracting and retaining effective teachers" (p. 7). Poor working conditions, the difficulty of serving a large population of students with a

broader range of needs, and the lack of adequate resources were factors contributing to this problem (Buckley, Schneider, and Shang, 2005).

Job dissatisfaction is one of the leading causes of teacher turnover. About half of all teachers who depart their jobs cite job dissatisfaction or the desire to pursue another job as a primary reason. Notably math and science teachers are significantly more likely to move from or leave their teaching jobs because of job dissatisfaction than are other teachers – 40 percent of math/science teachers compared to 29 percent of all teachers (Ingersoll, 2003, p.6). Using data collected by the National Center for Education Statistics (NCES), Ingersoll (2006) concluded that the supply of math/science teachers is not sufficient to cover pre-retirement losses of teachers due to job dissatisfaction.

In response to a growing shortage of math and science teachers, alternative route to certification programs were developed across the country. The National Center for Education Information (NCEI) collects data on a regular basis concerning these programs and their effectiveness. On May 17, 2007, Emily Feistritzer, President of the National Center for Alternative Certification and the National Center for Education Information, testified before the Committee on Education and Labor of the U.S. House of Representatives concerning these programs and their effectiveness. According to her testimony, there were only eight states in 1983 that offered alternatives to the traditional college teacher education program but by 2007, all 50 states had some type of alternate route to teacher certification.

Based on data submitted by the states, NCEI estimated that approximately 59,000 individuals were issued teaching certificates through alternative routes in 2005-06, up from approximately 50,000 in 2004-05 and 39,000 in 2003-04. Nationally, approximately one-third of new teachers being hired were coming through alternative routes to teacher certification and states reported that they intended to use these programs to meet the highly qualified teacher

requirements of the No Child Left Behind Act.

Those who support alternative route to certification programs claim that the participants are highly motivated to enter the teaching profession and they fill critical shortages in specific subjects and school districts. According to the testimony of Feistritz:

Alternative routes to teacher certification programs accept only individuals who not only already have a bachelor's degree, but come into a program because they want to teach. In most alternate route programs, the participants fill particular existing teacher vacancies. Alternative routes exist to recruit, train and certify baccalaureate degree holders to meet the demand for specific teachers to teach specific subjects at specific grade levels in specific schools. (U.S. House of Representatives, Committee on Education and Labor, May 17, 2007)

In 2005, the American Educational Research Association (AERA) released *Studying Teacher Education: The Report of the AERA Panel on Research and Teacher Education* (2005). This report reviewed the research on teachers who were trained via alternate routes. The compendium's findings indicated some evidence that teachers certified by alternate routes may be "more willing than traditionally certified teachers to teach in low-SES urban schools, but these data may reflect more where teachers can get jobs than actual teacher preferences" (p. 663).

The Connecticut Department of Education, also recognizing that there were serious shortages of math and science teachers, particularly in the urban centers of the state, urged the legislature in 1986 to authorize the development of accelerated teacher training programs to enable individuals to become certified teachers without going through either the traditional undergraduate programs or the more lengthy post-baccalaureate programs at the state's colleges

and universities. The Alternate Route to Teacher Certification (ARC), created in 1988, is a non-traditional, time-condensed program conducted by the Connecticut Department of Higher Education to attract mid-career professionals into teaching. ARC is intended for persons from diverse fields such as industry, government, the military or human services who wish to change careers, or those who want to reenter the work force. It is a non-credit program of preparation focused on pedagogical knowledge and skills for candidates who have already met subject-area major requirements (Connecticut Department of Education, 2009).

There are two ARC programs, ARC I and ARC II. ARC I consists of a nine-week, full-time summer session which runs from June into August, of which four weeks is student teaching. ARC II is a weekend session (Friday evenings and all day Saturdays) on three out of four weekends each month from late October into mid-May. ARC II students also complete a four-week student teaching experience at the end of their program. Students who successfully complete ARC I or ARC II are eligible to receive a "Temporary 90-Day Certificate" from the Connecticut State Department of Education once they have secured a teaching position in a public school. The 90-day certificate provides the opportunity for ARC graduates to be employed in a district while receiving additional support to help them make the transition to teaching. The district is required by state regulations to provide "a special plan of supervision" for the ARC-prepared teacher. ARC also provides a coach to help the teacher make the transition and who plays no role in the evaluation of the teacher (Connecticut Department of Education, 2009).

The time-condensed ARC program stands in sharp contrast to the certification requirements that must be met by the traditional undergraduates and the post-baccalaureate students. According to the Bureau of Teacher Certification (1998), prospective Connecticut secondary science teachers must complete a minimum of 18 semester credit hours in professional education courses, including foundations of education, educational psychology, curriculum and

teaching methods, and special education. A student teaching experience equivalent to 6 semester hours of credit is also required. All of the Connecticut colleges and universities offering undergraduate or post-baccalaureate certification programs require at least 12 weeks of full-time student teaching.

Since job dissatisfaction was found to be a primary reason for teacher turnover, we wanted to examine the level of morale among beginning science teachers in Connecticut and compare these levels for the type of teacher preparation program they attended. We also wanted to determine if other factors were related to their morale, specifically age, gender and where these beginning science teachers were employed. We were particularly interested in determining if the ARC teachers were filling shortages in low socioeconomic urban areas as suggested by the AERA (2005) study.

Methods

Participants

This study examined the morale of second year science teachers (grades 7 to 12) employed in Connecticut public schools to determine if there were differences in their reported job satisfaction based on the teacher preparation program they attended. Three different types of teacher preparation programs were compared: 1) traditional undergraduate, 2) post-baccalaureate certification and/or degree, and 3) alternative route to certification. Traditional undergraduate programs offer a bachelor's degree and prepare students to meet state certification requirements. Students begin their professional course preparation during their junior year. This group also includes those colleges and universities where students complete the bachelor's degree and remain at the institution for a fifth year of study, earning a master's degree in education. The post-baccalaureate certification and/or degree program group includes those colleges and

universities that serve students who already have earned a bachelor's degree in a field of science and have decided that they now want to pursue a teaching career. Colleges and universities in this category offer certification-only programs and/or a master's degree in education. These programs must meet the same state teacher certification requirements as the traditional undergraduate institutions. As described earlier, ARC is a time-condensed program that specifically serves adults with science degrees and who have pursued other careers prior to teaching. According to the Connecticut Department of Higher Education (2009), the ARC students "bring a wide variety of work experience and life experiences to classrooms across the state" (Connecticut Department of Education, p. 1).

We selected second year teachers for three reasons. First, we believed it was important for all the subjects to experience the complete cycle of a year of teaching, particularly the ARC graduates who were making a career transition. Second, we believed that a year of experience would enable the beginning teachers to respond more easily to the primary instrument employed in the study, the *Purdue Teacher Opinionnaire (PTO)*. Finally, and on a practical level, the Connecticut State Department of Education maintained a database on all second year teachers because they were participating in the Beginning Educator Support and Training (BEST) program, a mandated statewide teacher induction and assessment program. Based on data provided by the Connecticut State Department of Education, there were 166 secondary science teachers in their second year of public school teaching.

Data Collection

The Connecticut State Department of Education provided addresses and e-mail lists of the 166 secondary science teachers. In June 2007, a cover letter along with the *Purdue Teacher Opinionnaire (PTO)* and a demographic survey form was mailed to these teachers explaining the nature of the study and inviting them to participate. The cover letter included an internet link to

complete the *PTO* and the demographic survey form online, if they preferred. A stamped, self-addressed return envelope was included in the mailing. All participants also received an e-mail with the same cover letter that was mailed. The e-mail included the internet link to take the two instruments online.

If subjects elected to complete the hard-copy version of each instrument, they were asked to return their completed packets within three weeks. A follow-up email was sent twenty days later to all subjects in effort to increase the return rate. This follow-up e-mail increased the return rate from 88 to 101 complete responses.

Instrumentation

The *Purdue Teacher Opinionnaire (PTO)* was used to measure each teacher's level of morale. According to Lester and Bishop (2000), "The *PTO* is the most frequently cited instrument to measure morale" (p. 184). Teacher morale was defined by Bentley and Rempel (1970) in the *Purdue Teacher Opinionnaire* manual as the extent to which an individual teacher's needs were satisfied, and the extent to which the individual perceived satisfaction as stemming from the job. The instrument consists of ten morale factors that the authors defined as follows:

1. Teacher rapport with principal: addressed the teacher's feelings about the principal, including the principal's professional competency, interest in teachers and their work, ability to communicate, and skill in human relations;
2. Satisfaction with teaching: addressed teacher relationships with students and feelings of satisfaction with teaching. According to this factor, the high morale teacher loves to teach, feels competent in his job, enjoys his students, and believes in the future of teaching as an occupation;

3. Rapport among teachers: focuses on a teacher's relationships with other teachers, specifically the cooperation, preparation, ethics, influence, interests, and competency of peers;
4. Teaching salary: measures a teacher's feelings about salaries and salary policies. Included are items measuring teacher perceptions of the degree to which salaries are related to competency, how the salaries compare with those in other school systems, whether salaries are administered fairly and justly, and whether teachers participate in developing salary policies;
5. Teaching load: addressed such matters as record keeping, clerical work, "red tape", community demands on teacher time, extra-curricular load, and keeping up to date professionally;
6. Curriculum issues: concerned with the teachers' reactions to the adequacy of the school program in meeting students' needs, providing for individual differences, and preparing students for effective citizenship.
7. Teacher status: addressed feelings about the prestige, security, and benefits afforded by teaching, as well as the extent to which the teacher feels accepted as a member of the community
8. Community support of education: concerned with the teacher's perception of the extent to which the community understands and supports a sound educational program;

9. School facilities and services: the teacher's perceptions of the adequacy of facilities, supplies, and equipment available, as well as the efficiency of the procedures for obtaining materials; and
10. Community pressures: concerned with the teacher's perceptions of community expectations with respect to the teacher's personal standards, participation in outside-school activities, and freedom to discuss controversial issues in the classroom.

Bentley and Rempel (1970) reported that the test-retest correlations for the subscales ranged from .62 to .88. The *PTO* used a four-point Likert-type scale for 74 questions in which: (1) represented agree, (2) represented probably agree, (3) probably disagree, and (4) disagree. In the remaining 26 items, the scale is reversed using: (1) to represent disagree, (2) probably disagree, (3) probably agree, and (4) agree. Therefore, mean scores for each factor may range from 1.0 to 4.0.

A demographic form was used to collect personal information on each teacher, specifically age, gender, employing district and type of teacher preparation program attended. The three types of programs included: 1) a traditional, undergraduate program, 2) a post-baccalaureate program at a college or university leading to certification and/or a master's degree, and 3) the state's alternative route to certification program.

Data Analysis

Data was analyzed using descriptive statistics, correlations, and analysis of covariance (ANCOVA). Frequencies were used to report the distribution of participants by gender, age and socioeconomic status of employing district for each of the teacher preparation programs. The mean and standard deviations for each of the *PTO* factors for each type of program were also reported. Correlations were employed to examine relationships between morale and the age,

gender and the socioeconomic ranking of the districts employing the beginning science teachers. ANCOVA was used to test for differences between the three programs for morale, using gender, age and socioeconomic status of employing district as covariates in order to control for the effects of these variables. The .05 probability level was used to test for levels of significance.

Results

Responding Sample

The responding sample was 110 teachers (66.27% of population) and the data generating sample was 101 (60.84% of population). Nine respondents were eliminated due to missing or incomplete responses. Three of the nine eliminated responded they had left the field of teaching.

In terms of type of training program, there were 26 ARC teachers, 26 post-baccalaureate teachers, and 49 traditional undergraduate teachers in the data-generating sample. Males and females were equally represented in the ARC group, with the post-baccalaureate teachers consisting of slightly more females (57.7%) than males (42.3%). The undergraduate trained teachers had twice as many females (67.3%) than males (32.7%).

The age of the beginning teachers was related to their type of preparation program (see Table 1). The ARC program participants were older than the other two groups. For the ARC program, approximately 46% reported that they were at least 40 years old, while 63% of teachers prepared at undergraduate institutions were under the age of 30. The age of the post-baccalaureate trained teachers fell between these two extremes, with the majority (62%) reporting that they were between 25 and 34 years old.

Table 1.

Age of Participants by Teacher Preparation Program

Age	<u>ARC</u>		<u>Post-baccalaureate</u>		<u>Undergraduate</u>	
	N	%	N	%	N	%
20-24	0	0.0	0	0.0	7	6.9
25-29	5	19.2	10	38.5	24	38.6
30-34	5	19.2	6	23.1	4	14.9
35-39	4	15.4	4	15.4	7	14.9
40-44	3	11.5	1	3.8	2	5.9
45-49	2	7.7	0	0.0	3	5.0
50 or older	7	26.9	5	19.2	2	13.9

Employing Districts

The subjects reported the school district in which they were employed and each district was placed into one of nine District Reference Groups (DRGs). According to the Connecticut Department of Education (2007), DRG is a classification system that groups school districts together of similar socioeconomic status into one of nine ranked educational reference groups named A through I. The most affluent and low-need districts, as measured by socioeconomic indicators, are grouped in DRG A, while the poorest and highest need districts are grouped in DRG I. DRG I districts include all of the large, urban centers in Connecticut.

There were differences in where these beginning science teachers were employed (see Table 2). Although the ARC program was developed to help fill shortages in science teaching in

urban areas where turnover and unfilled positions were most acute, 30.7% of the ARC teachers were employed in districts which were among the highest socioeconomic communities in the state (DRGs A and B); only 18.3% of the undergraduate group were working in these affluent districts. For DRGs H and I (the lowest socioeconomic districts in the state), only 11.5% of the ARC teachers were employed in these schools. The graduates of the state’s post-baccalaureate programs were the ones most likely to be employed by the urban and lower socioeconomic districts, with 46.2% working in DRGs H and I.

Table 2.

DRG of Employing Districts by Teacher Preparation Program

DRG ^a	<u>ARC</u>		<u>Post-baccalaureate</u>		<u>Undergraduate</u>	
	N	%	N	%	N	%
A	1	3.8	4	15.4	3	6.1
B	7	26.9	3	11.5	6	12.2
C	3	11.5	1	3.8	4	8.2
D	7	26.9	2	7.7	10	20.4
E	1	3.8	0	0.0	3	6.1
F	0	0.0	1	3.8	6	12.2
G	4	15.4	3	11.5	6	12.2
H	2	7.7	6	23.1	9	18.4
I	1	3.8	6	23.1	2	4.1

^aDRG is District Reference Group

Levels of Morale

This section reports the levels of morale of the teachers as well as the relationships between morale and age, gender, DRG, and type of training program.

Table 3 displays the means and standard deviations for the *PTO* factors, including total morale, by type of teacher preparation program. Satisfaction with teaching was the highest mean score for all three groups, with all averages above 3.0. These results indicated that the beginning science teachers across all three teacher preparation groups were generally satisfied with their relationships with students, loved to teach, felt competent in the job, and believed in the future of teaching as an occupation.

Teacher salary was the lowest mean score for the ARC trained teachers (2.46) while teacher load was the lowest mean score for the post-baccalaureate group (2.47) and traditional undergraduates (2.63)

For seven of the ten *PTO* factors, and for total morale, beginning science teachers trained at undergraduate institutions reported the highest levels of morale while ARC trained teachers had the lowest morale means for five factors and for total morale.

Table 3.

Morale of Teachers by Type of Preparation Program

Morale	<u>ARC</u>		Post- <u>baccalaureate</u>		<u>Undergraduate</u>	
	M	SD	M	SD	M	SD
Total morale	2.77	.34	2.83	.31	2.92	.36
Rapport with principal	2.67	.54	2.71	.70	2.84	.68
Satisfaction with teaching	3.08	.54	3.24	.38	3.25	.45
Rapport among teachers	2.98	.40	3.13	.44	3.17	.48
Teacher salary	2.46	.57	2.48	.59	2.82	.47
Teacher load	2.58	.42	2.47	.62	2.63	.54
Curriculum issues	2.92	.54	2.79	.45	2.83	.53
Teacher status	2.46	.53	2.59	.55	2.78	.52
Community support	2.81	.68	2.65	.70	2.91	.71
School facilities/services	2.53	.54	2.80	.79	2.66	.74
Community pressures	2.73	.48	2.61	.74	2.64	.57

Relationships between morale and age, gender, and the socioeconomic ranking of the employing district (DRG) were examined. The Pearson product-moment correlation was used for gender, with female being dummy coded as 0 and male coded as 1. Spearman's rank correlation coefficient was computed for age and DRG as these two variables were in the form of ordinal data. Each age group was coded with a number from 1 to 7, with ages 20-24 coded as 1

and ages 50 and older as 7. Each DRG was coded with a number from 1 to 9, with DRG A (highest socioeconomic status) coded as 9 and DRG I (lowest socioeconomic status) as 1.

Several significant relationships were identified (see Table 4). As age increased, satisfaction with teacher status ($r = -.23, p < .05$) and school facilities/services ($r = -.31, p < .01$) decreased. For gender, females were more likely to be satisfied with teacher load ($r = -.21, p < .05$) and pressures from the community in which they worked ($r = -.31, p < .01$). The socioeconomic ranking of the employing district was significantly related to total morale ($r = .28, p < .01$) and four of the morale factors: rapport with principal ($r = .23, p < .01$), rapport among teachers ($r = .23, p < .05$), community support for education ($r = .40, p < .01$), and school facilities and services ($r = .34, p < .01$). As socioeconomic ranking of the employing district increased, so did the morale of the teachers.

ANCOVA was employed to test for statistically significant differences ($p < .05$) between the three-teacher preparation programs for total morale and for each of the morale factors. Age, gender and socioeconomic ranking of the employing district (DRG) served as covariates. The ANCOVA indicated if there was a significant effect of the teacher preparation program on morale after controlling for the effect of age, gender, and DRG. Prior to running each ANCOVA, Levene's Test was conducted to confirm that the variance across the three teacher preparation groups were not significantly different. None of the Levene's Tests were significant ($p > .05$); therefore, the ANCOVA analysis could proceed without violating assumptions of variance homogeneity.

The ANCOVA analysis revealed that there were no significant differences between the three teacher preparation groups for total morale and for nine of the ten morale factors, after controlling for the effects of age, gender, and socioeconomic status of employing district. However, teacher salary was found to be significantly different across the three groups ($F(2,95)$

= 4.62, $p = .01$) and DRG was identified as a significant covariate ($F(1,95) = 4.49$, $p = .04$).

Using Bonferroni as a post-hoc analysis test, a significant difference ($p = .02$) was found between the ARC teacher mean score for teacher salary (2.46) and the traditional undergraduate teacher mean score (2.82). Therefore, based upon these results, the beginning science teachers with the lowest levels of satisfaction with teacher salary were most likely the ARC trained individuals working in the lowest socioeconomic school districts.

Table 4.

Correlations between Morale and Age, Gender and DRG of Employing District

	<u>Age</u>	<u>Gender</u>	<u>DRG^a</u>
Morale			
Total morale	-.13	.03	.28**
Rapport with principal	-.07	.15	.23*
Satisfaction with teaching	-.05	-.05	.02
Rapport among teachers	.00	.04	.23*
Teacher salary	-.11	-.04	.18
Teacher load	-.06	-.21*	.08
Curriculum issues	-.08	-.13	.17
Teacher status	-.23*	.12	.11
Community support	-.10	.16	.40**
School facilities/services	-.31**	.19	.34**
Community pressures	.11	-.27**	.07

^aDRG is District Reference Group

* $p < .05$, ** $p < .01$

Discussion

Advocates of alternative route to certification cite that a major advantage of this type of program is that it draws from a more experienced pool of beginning teacher candidates, individuals who have held other careers and have gained prior work and life experiences in fields related to the subject they teach. However, this study has also revealed that this may be a double-edge sword. Although the ARC science teachers may express a desire to teach after pursuing other careers, they also express a disappointment in the pay they are receiving as teachers.

For the ARC graduates, this finding of lower morale related to salary is interesting given that they were more likely to be employed in the most affluent Connecticut districts, compared to the post-baccalaureates and the undergraduates. Even though the results of this study indicated that satisfaction with teacher salary increased as the socioeconomic status of the employing district increased, the ARC trained teachers were still less satisfied with their salaries compared to the traditional undergraduates who were more likely to be working in the less affluent districts. Therefore, this study could not confirm the fact that alternative route beginning science teachers in Connecticut were filling job shortages in urban areas; quite the contrary, it appeared that they were going where the salaries were the highest.

One possible explanation for this finding is the concept of opportunity cost or what must be given up as a result of a decision to teach. The opportunity cost for a college graduate trained in the field of science is the highest wage this person could have earned elsewhere in the job market (Murnane and Steele, 2007). Opportunity cost is likely to be an even greater issue for individuals with degrees in science, as they have many prestigious and lucrative opportunities to consider (Abell et al., 2006). Therefore, the ARC teachers may be choosing to work in the more affluent school districts where teacher salaries are higher in an effort to reduce their opportunity

costs, or the differential between their former pay and their new salary as a teacher.

Even though an individual may decide to give up this opportunity cost and enter the profession of education, over time salary becomes an important factor in retaining these teachers. The American Federation of Teachers (AFT) 2005 report, *The Survey and Analysis of Teacher Salary Trends*, stated one in every three teachers who leaves the profession within the first 10 years of service cites salary as a reason. The survey also found beginning teacher salaries have failed to keep pace with inflation during the 2003-04 and 2004-05 school years. Beginning teacher salaries still are losing ground, albeit more slowly than average teacher salaries. Teachers earned less and their earnings grew at a slower rate compared with other college-educated workers (AFT, 2005). Therefore, if ARC science teachers continue to be dissatisfied with their salaries, even after working in the highest socioeconomic districts in the state, they may be at risk of leaving the profession.

In order to combat the salary issue for the ARC graduates, some Connecticut districts are beginning to offer credit on the salary schedule for non-teaching, but subject-related work experience. These are not typically one-for-one credits, but rather a percentage of non-teaching experience. For example, one district allows administrators to grant up to 40% of work-related experience to a new teacher, in effect placing the beginning teacher at a higher salary step. This would enable second career candidates to earn significantly more income, reducing their opportunity costs or the differential between the salaries they earned in their former jobs with their new pay as beginning teachers.

Although salary is a factor in attracting and retaining teachers, working conditions are equally important (Johnson, Berg, and Donaldson, 2005; Perie and Baker, 1997). This study found that Connecticut beginning science teachers employed in lower socioeconomic school districts were more likely to be dissatisfied with their relationships with the principal, their

relationships with teachers, community support for education, and the quality of the school facilities and services. These findings provide some insights into why urban districts are finding it much more difficult to attract and retain teachers, particularly in subject area shortages. Some of these issues may be difficult for school leaders to influence, such as the community support for education or the overall condition of the school facilities and services due to lack of financial resources. However, they can certainly address issues related to their own relationships with the beginning teachers as well as the relationships among the teachers. Establishing personal relationships with beginning teachers, fostering positive mentoring relationships with other science teachers, and creating professional learning communities within these schools would be viable strategies for leaders to employ in order to improve beginning teacher morale and retain teachers (Smith and Ingersoll, 2004).

Research on the relationships between morale and gender and age has not been conclusive. This study found that female beginning science teachers were more satisfied with their teacher load and felt less community pressure than male teachers but Bishay (1996) concluded that high school female teachers felt more burdened with paperwork and overall they expressed lower levels of satisfaction. The present study also found that as age increased, satisfaction with teacher status and the facilities and services of the school declined among the beginning science teachers. Other studies have concluded that teacher job satisfaction tends to increase with age (Bishay, 1996; Chapman, 1984). However, Bhella (1982) examined secondary teacher morale and found no relationships to age and gender. The relationships between morale and gender and age need further research.

Conclusions and Recommendations for Future Research

This study of beginning secondary science teachers in Connecticut revealed that these

individuals had moderately high levels of overall morale, particularly their satisfaction with teaching. This was the highest morale factor across all three-teacher preparation groups.

However, when the teachers were compared based on their type of teacher preparation program, significant differences for satisfaction with teacher salary were revealed after controlling for age, gender and the socioeconomic status of the employing district.

The development of alternative routes to teacher certification have grown dramatically in the United States during the first part of the twenty-first century due to the shortage of highly qualified math and science teachers and the need to employ such individuals as required by the No Child Left Behind Act. Although Connecticut teachers trained via this alternative route may have expressed a desire to teach, they were significantly less satisfied with their pay during their second year of employment. Satisfaction with salary is known to be related to the retention of beginning teachers.

Alternative route to certification programs were also developed to fill shortages in the urban school districts, but there was little evidence of this occurring in Connecticut for these beginning science teachers. The alternative route teachers were more likely to be employed in the most affluent districts while the traditional undergraduates and post-baccalaureate teachers were more likely to be hired in the urban centers of the state.

School leaders in these lower socioeconomic, urban communities will need to work more diligently on attracting and retaining beginning teachers in shortage areas. Increasing initial pay and negotiating more flexibility to grant salary credit for work-related experience will help attract and retain teachers, but this alone will not be sufficient. School leaders need to attend to working conditions, too. Some of the morale factors related to the socioeconomic status of the teacher's employing district may be beyond the control of school administrators (such as community support for the schools), but certainly relationships between the beginning teachers

and the principal and colleagues can be addressed and improved.

The results and limitations of this study prompt recommendations for further research. First, the study should be replicated in other states and in other subject areas where alternative route to certification programs are being used to fill teacher shortages since this study was limited to beginning science teachers employed in the state of Connecticut. This would improve the generalizability of this study and provide a clearer picture of the differences in morale of beginning teachers for the type of teacher preparation program and by subject area. Second, since this study was limited to second year teachers, future research might examine how morale changes over time, particularly during the first five years of employment for beginning teachers trained via the three different types of programs and by gender, age and type of employing district, as well. Third, a study should be conducted to examine the retention rates of beginning teachers in Connecticut and in other states based on their teacher preparation program and the type of district in which they were employed. For those who left the profession, particularly those working in shortage subject areas, their reasons for leaving should be collected and analyzed.

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