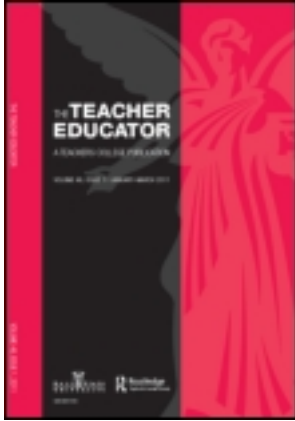


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Characteristics of Teacher Induction Programs and Turnover Rates of Beginning Teachers

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RESEARCH ARTICLE

**CHARACTERISTICS OF TEACHER INDUCTION
PROGRAMS AND TURNOVER RATES OF
BEGINNING TEACHERS**

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The federal School and Staffing Survey (SASS) and Teacher Follow-up Survey (TFS) were used to examine the impacts of induction activities on beginning teacher turnover. This study excluded those teachers who moved or left schools for unavoidable and involuntary reasons, a confounding factor in previous research. This analysis revealed that three induction activities are beneficial in significantly reducing turnover rates for beginning teachers: seminars, common planning time, and extra classroom assistance.

In the early 1980s, a series of reports predicted that increasing student enrollments and teacher attrition would soon cause teacher shortages. These reports indicated that too many teachers—especially the better ones—leave the profession within a few years (Grissmer & Kirby, 1997; Murnane, Singer, Willett, Kemple, & Olsen, 1991; Schlecty & Vance, 1981; Henke, Chen, & Geis, 2000). Two approaches have been used to help overcome the possibility of school staffing shortages: (a) recruitment of new teachers from alternative licensing programs and through emergency teaching licensure (e.g., Teach for America) and (b) mentoring and induction programs to reduce the rates at which teachers leave the profession, especially early in their new careers. This study examined the latter of these approaches.

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In recent decades comprehensive induction programs have been introduced to help beginning teachers cope with the intellectual and emotional complexity of classroom instruction. Such programs have gradually been adopted by many school districts and states. Research supports the effectiveness of comprehensive induction programs on teachers' job satisfaction (Johnson, Berg, & Donaldson, 2005; Public Education Network, 2003) and student achievement (Fletcher, Strong, & Villar, 2008; Strong, 2006).

Although the current literature suggests that induction programs have some positive influence on teacher retention, many of those findings come from qualitative studies that lack generalizable findings. Smith and Ingersoll (2004) conducted one of the few quantitative studies to examine this relationship. They examined the influence of induction programs on the retention of beginning teachers using the data sets from the 1999–2000 Schools and Staffing Survey (SASS) and 2000–2001 Teacher Follow-up Survey (TFS). In their analysis, Smith and Ingersoll considered many variables that might influence induction program results, such as teacher and school characteristics. The authors concluded that induction programs have some positive influence on beginning teachers' retention, especially those that used mentors from the same subject field and those that participated in collective induction activities. Teachers in programs that had these characteristics were less likely to leave their school or the profession (i.e., less likely to be "turnover teachers").

Smith and Ingersoll (2004) treated turnover teachers (those that left the profession rapidly) as a homogenous group of teachers. Turnover teachers, however, can be divided into a few different subgroups. First, they can be distinguished as voluntary turnover teachers and involuntary turnover teachers. Involuntary turnovers are the teachers who are transferred to another school or leave the area or the profession based on another person's decision (e.g., layoff due to budget considerations). These new teachers are forced to move from their schools or even to leave their profession for reasons that have nothing to do with the quality of any induction program in which they may have participated. Separating voluntary turnovers from involuntary turnovers would provide a clearer picture of the role that induction programs play in affecting teacher turnover rates.

A second consideration is that voluntary turnovers can be divided into avoidable and unavoidable voluntary turnovers (Dalton, Krackhardt, & Porter, 1981; Abelson, 1987). According to Abelson (1987), teachers classified as avoidable turnovers are different from unavoidable turnovers in terms of levels of job satisfaction, job-induced tension, and the organizational commitment of the system that they joined. Abelson

found that the levels of satisfaction and perceptions of organizational commitment of the avoidable turnovers are lower than those classified as unavoidable turnovers. In addition, the job tension of avoidable turnovers was greater than that of unavoidable turnovers, although statistically not significant. Avoidable voluntary turnover assumes that the decision to leave a school has to do with job dissatisfaction (e.g., better pay, better work conditions, leadership, and organization), characteristics of the job that theoretically could be fixed by a more enlightened or benevolent leadership team. These variables associated with turnover rates are, to a large degree, under organizational control. Unavoidable voluntary turnover assumes the decision to leave was beyond the control of the school enterprise, and has to do with personal or family reasons (e.g., moving, career change, and child rearing). These variables are assumed to be outside of organizational control. When observing the relationship between induction activities and retention in the profession, inclusion of these groups will mislead when reporting data about teacher turnover (Dalton et al., 1981).

Additionally, a recent study revealed completely different results about comprehensive induction programs. Glazerman et al. (2008) asserted that comprehensive induction programs did not show any positive impact on teacher outcomes. This study compared two induction programs, a comprehensive induction program and a prevailed induction program after 1 year of implementation. The authors concluded that there was no significant difference in outcomes associated with teacher practice, retention, and student outcome. The study has some merit in terms of developing and practicing rigorous empirical research, but it also has limitations. First, this study was conducted only 1 year after the comprehensive induction program was implemented, leaving little room for error in its maiden voyage and raising questions as to whether the program was implemented thoroughly enough to be evaluated fairly. Second, the method of selecting the teachers for the treatment and control groups was unorthodox. The authors selected teachers who were part of the comprehensive induction program as the treatment group and teachers who received “less structured induction programs” or “prevailed induction program” as the control group. According to the authors, the quality of the prevailed induction program was significantly different from the comprehensive induction program, and yet both programs provided the same induction activities. In other words, the authors compared two slightly different induction programs with the only discernable differences being the time that teachers participated and the quality of service. The most appropriate comparison group would have been teachers who were not enrolled in an induction program or enrolled in a basic induction program

(mentoring and administrators' support), which is the most common form of induction program (Smith & Ingersoll, 2004). The authors found no outcome differences between the two induction programs, but because of the limitations discussed previously, all stakeholders should use caution when generalizing the results.

The purpose of this study was to examine the relationship of teacher induction programs to teacher retention, specifically using a sample that only included teachers whose turnover was avoidable. This consideration will allow to generate another quantitative and rigorous study. The following research question guided this study: After controlling for some teacher and school characteristics, what were the effects of induction programs on teacher turnover when the reasons for leaving the profession were voluntary and avoidable?

Methodology

Data

The data used in this study were from the 1999–2000 School and Staffing Survey (SASS) and the 2000–2001 Teacher Follow-up Survey (TFS). The SASS is the most comprehensive data source related to information about teachers and administrators. The survey has been conducted six times between 1987 and 2009 by the National Center for Education Statistics (NCES).

The 1999–2000 SASS consisted of five core components: The school district questionnaire, the school questionnaire, the school principal questionnaire, the school teacher questionnaire, and the school library media center questionnaire. The sample size of SASS 1999–2000 included approximately 72,000 elementary and secondary school teachers. The TFS of 2000–2001 was conducted with the same schools and teachers one year after the SASS.

Sample, Weighting, and Variance Estimation

The total sample size of the Teacher Follow-up Survey 2000–2001 was 5,788, including 2,149 former teachers and 3,639 current teachers (including 1,324 transfer teachers and 2,315 staying teachers). With the restricted model excluding involuntary and unavoidable turnover teachers, the sample size was reduced to a total of 1,556 teachers, including 565 former teachers and 1,313 current teachers (including 468 moving teachers and 844 staying teachers).

The SASS and TFS survey data were collected using a complex sample design instead of simple random sampling; therefore, it is important to use survey data analysis software to take into account the differences between the design used and simple random sampling. For these analyses we used the STATA software package because it is one of survey data analysis software packages especially designed for complex surveys like SASS and TFS. This software takes into account the clustering of teachers within schools, a result of the complex, multilevel design of the SASS sample. Because the dependent variables are nominal and have three categories (stayers, movers, and leavers) multinomial logistic regression procedures were used. In order to display the regression results relative risk ratios (*rr*) were used. Relative risk refers to the ratio of the probability of choosing one outcome category (movers or leavers) over the probability of choosing the baseline category (stayers).

The purpose of weighting in this study was to produce population estimates from the SASS and TFS sample data. Each observation included its own weight, compensating for the over- and under-sampling characteristic of the complex stratified survey designs. The SASS sample design and estimation included procedures that deviate from the assumption of simple random sampling, such as stratifying the school sample, oversampling new school teachers, and sampling with differential probabilities. In most cases of a simple random sample, direct estimates of the sampling errors were used. However, in surveys with complex sample design, such as SASS, direct estimates of the sampling errors will typically underestimate the variability associated with those estimates. Therefore, the SASS calculated sampling errors to respond to the complex sample design of SASS. The original researchers used the replication method to determine sampling errors. The replication method involves constructing a number of subsamples (replicates) from the full sample and computing the statistic of interest for each replicate. Each SASS and TFS data file included a set of 88 replicate weights designed to produce variance estimates. Replicate weights were created for each of the 88 samples using the same estimation procedures applied to the full sample and are included in the data files. Most of the replicate weights were produced using a bootstrap procedure (Tourkin et al., 2004).

Procedures

The design of this study was guided by the hypothesis that induction programs support beginning teachers who otherwise might decide to change schools or leave the profession. In order to understand the

influences of induction programs on teacher turnover decisions, it was necessary to know the details of both turnover teachers and various induction activities.

First, turnover teachers in this analysis included new teachers who leave the profession and those who move to another school after the first year of teaching, whether they move schools within the same district or not. From an organizational-level perspective, employee migration is as important as employee attrition in terms of the performance and effectiveness of organizations (Ingersoll, 2001). Whether a teacher leaves the profession or moves to another school, it is of concern because such actions quite often affect school performance, particularly the cohesion among faculty and staff at a school site.

Second, turnover teachers were divided into several subgroups: Involuntary turnover teachers and voluntary turnover teachers; and within the voluntary turnover subgroup, they were divided into two subgroups—unavoidable and avoidable—classified based upon the reasons that the leaving teacher provides to account for their decision to leave either school or the profession. Involuntary turnover teachers move or leave their school for different reasons than voluntary turnover teachers. For involuntary turnover teachers, the choice to move or leave the profession is dictated by the school or district (as in a reduction in staff due to budget difficulties), or because of a health condition that is not of their own volition.

Third, induction activities included in this analysis were mentoring, seminars, collaboration, planning time, supportive communication, reduced teaching schedule, reduced number of preparations, extra classroom assistance, classroom observation, and teacher network. School characteristics considered in this study included school location, size, level, and sector. Teacher characteristics controlled for in this study included full time status, age, gender, school earnings, certification, ethnicity, subject, and degree (see Table 1).

Analysis

An analytic model was created to examine the influences of induction programs on beginning teacher turnover among avoidable turnover teachers, those who move to another school or leave the profession due to job dissatisfaction or working conditions, after controlling for both teacher-level and school-level characteristics. Involuntary turnover and unavoidable turnover teachers were excluded from these analyses. Thus the model excludes teachers who were laid off or transferred involuntarily, changed residence, developed health problems, retired,

TABLE 1 School and Teacher Characteristics

Variables	Survey information obtained
Urbanicity	Urban, Urban fringe of large or mid-size city, Rural
School size	Small school (Fewer than 300 students) Medium size school (300 to 499 students) Large school (500 or more students)
School level	Elementary, Secondary, Combined school
School sector	Public, Private school
Full-time status	Regular full-time, Part-time teacher (include regular part-time teacher, itinerant teacher, and long-term substitute)
Age in years	<30, 30–39, 40–49, 50+
Gender	Male, Female
School earnings	<\$30,000, \$30,000–\$39,999, \$40,000–\$49,999, >\$50,000
Certification	Provisional, temporary, emergency or no certification Probationary, regular, or advanced certification
Race	White (non-Hispanic), Minority (American Indian or Alaska Native, not-Hispanic, Asian or Pacific Islander, non-Hispanic, Black, non-Hispanic, Hispanic, regardless of race)
Subject teaching	Math and Science, ESL, Special Education
Degree	No Bachelor's degree, Bachelor's degree, Master's degree, Doctorate or first professional degree

were not working because of pregnancy or child rearing, and who listed other family/personal reasons.

This analytic model uses another variable associated with turnover: teachers' assessment of the importance of certain factors in the decision leading to turnover. Teachers who marked 4 (very important) or 5 (extremely important) on the 1-to-5 scale were included in these other analyses.

The basic analysis plan uses the following statistical formula:

$$\hat{Y} = b_0 + b_1A + b_2B + b_3\Gamma$$

where \hat{Y} is the dependent variable, or teacher's final status (stay, move, or leave), b_0 , b_1 , b_2 , and b_3 are regression coefficients, A is the teacher characteristics vector, B is the school characteristics vector, and Γ is the induction activity vector (see Table 2).

The SASS public-use data are available to everyone upon request, but when the SASS 2003–2004 was requested for this study, it was out of stock; there was not another avenue to acquire the data set. So, the

TABLE 2 Independent Variables, Dependent Variables, and Elements of Each Variable

Variables	Elements
Teacher characteristics (A)	Full-Time Status, Age, Gender, School Earnings, Certification, Race, Degree; Math and science, Special education, ESL
School characteristics (B)	Urban or rural, Secondary school, Enrollment more or less than 300, Combined school (K–12); Catholic, other religious or nonsectarian
Induction activities (G)	Beginners’ seminars, Formal collaboration, Planning time, Supportive communication, Reduced schedule, Reduced preparation, Extra help, Observational visits, Teacher network
Teacher’s final status (\hat{Y})	Stay, Move, Leave

2000–2001 TFS was used as the primary data set for the analysis of induction program influence on teacher turnover. It was particularly useful because it surveyed the reasons teachers give for their having turned over. The TFS was composed of two separate groups of teachers: current teachers (stayers and movers) and former teachers (teachers who left the profession). The survey asked teachers to identify their reasons for staying, moving, or leaving. The TFS offered teachers who were movers 13 possible reasons for moving; teachers were asked to mark the level of importance for each reason on a 1-to-5 scale (1: Not at all Important, 2: Slightly Important, 3: Somewhat Important, 4: Very Important, and 5: Extremely Important). The survey offered former teachers (those leaving the profession) 17 possible reasons for leaving (see Table 3), and they also marked the level of importance for each reason on the same 1-to-5 scale.

Results

Descriptive analysis of teacher characteristics showed that about 90% of beginning teachers started their careers with full-time status; however, fewer beginning teachers in the private sector started teaching full-time (82%) than their counterparts in the public sector (91%). Teacher certification data revealed that about 76% of beginning teachers in public schools hold regular certification, but only 32% of beginning teachers in private schools hold regular certification. Public schools

TABLE 3 Reasons for Turnover

Movers	Leavers
1. Change residence	1. Change residence
2. Better salary/benefits	2. Pregnancy/child rearing
3. Job security	3. Health
4. Better teaching assignment	4. To retire
5. Workplace conditions	5. Not allowed to teach with other state teacher certification
6. Lack of administrator support	6. Laid off/involuntarily transferred
7. Changes in job description/responsibility	7. Sabbatical or other break
8. Not prepared to implement new reform measures	8. Better salary/benefits
9. Not agree with new reform measures	9. Another career
10. Laid off/involuntarily transferred	10. Take course within the field of education
11. Lack of classroom autonomy	11. Take course outside the field of education
12. Dissatisfied with professional development opportunity	12. Lack of community support
13. Dissatisfied for other reasons	13. Dissatisfied with job description/responsibilities
	14. Dissatisfied with changes in job description/responsibilities
	15. Not prepared to implement new reform measures
	16. Not agree with new reform measures
	17. Other family/personal reasons

have a greater concentration of minority teachers (21%) than do private schools (15%). In terms of holding a degree, less than 1% of beginning teachers in the public schools have no bachelor's degree. On the other hand 13% of private school teachers have no bachelor's degree. In the two sectors about 80% of beginning teachers in public schools, and 70% of the teachers in private schools, hold a bachelor's degree (see Table 4).

The analysis revealed that four induction activities were commonly practiced: supportive communication with the principal or other administrators (77%), regular-scheduled collaboration with other teachers on issues of instruction (62%), seminars or classes for beginning teachers (61%), and common planning time with teachers in the same subject (41%, see Table 5). Beginning teachers in the private sector were more likely to leave (22%) than move (10%) after the first year of teaching.

TABLE 4 Descriptive Statistics (Multinomial Logistics Regression Analysis, Weighted)

	Total		Public		Private	
	Mean	SE ¹	Mean	SE ¹	Mean	SE ¹
Teacher Characteristics						
Full time	0.90	0.00**	0.91	0.01*	0.82	0.02*
Age	31.38	0.30	31.16	0.38	31.98	0.30
Male	0.27	0.01*	0.27	0.02*	0.28	0.02*
School earnings (\$ thousands)	31.81	0.25	31.57	0.29	33.09	0.35
Regular certification	0.69	0.01*	0.76	0.02*	0.32	0.02*
Minority	0.19	0.02*	0.21	0.02*	0.15	0.02*
Math and science	0.17	0.01*	0.17	0.02*	0.17	0.02*
ESL	0.01	0.00**	0.01	0.00**	0.00	0.00**
Special education	0.09	0.00**	0.11	0.01*	0.03	0.00**
No Bachelor's Degree	0.03	0.00**	0.01	0.00**	0.13	0.02*
Bachelor's Degree	0.78	0.02*	0.80	0.02*	0.70	0.02*
Master's Degree	0.19	0.01*	0.19	0.02*	0.17	0.02*
School Characteristics						
Urban	0.30	0.02*	0.28	0.02*	0.46	0.02*
Rural	0.20	0.01*	0.21	0.02*	0.14	0.02*
Enrollment less than 300	0.18	0.01*	0.11	0.01*	0.52	0.02*
Enrollment 300–499	0.19	0.01*	0.20	0.02*	0.15	0.02*
Enrollment 500 and more	0.54	0.02*	0.61	0.02*	0.20	0.02*
Elementary	0.63	0.02*	0.67	0.02*	0.45	0.02*
Secondary	0.29	0.01*	0.32	0.02*	0.17	0.02*
Combined	0.08	0.00**	0.02	0.00**	0.39	0.02*
Public	0.83	0.00**	0.83	0.00**	—	—
Catholic	0.05	0.00**	—	—	0.05	0.00**
Non-Catholic	0.08	0.00**	—	—	0.08	0.00**
Nonsectarian	0.04	0.00**	—	—	0.04	0.00**

Note. ¹SE reflects standard error.

* $p < .05$; ** $p < .01$.

In contrast, beginning teachers in the public school were more likely to move (14%) than leave the profession (9%, see Figure 1). This might be explained by the different percentage of teacher certification between public and private school beginning teachers. This study examined teacher characteristics, including certification status of beginning teachers as they relate to turnover (see Table 4). A review of these data revealed that 76% of beginning teachers in public schools and 32%

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TABLE 5 Descriptive Statistics of Induction Activities (Weighted)

	Mean	SE ¹
Supportive communication	0.77	0.02*
Collaboration	0.62	0.01*
Seminars	0.61	0.02*
Planning time	0.41	0.02*
Observational visit	0.32	0.02*
Extra classroom help	0.28	0.01*
Teacher network	0.21	0.02*
Reduced preparation	0.08	0.00**
Reduced schedule	0.07	0.00**

Note. ¹SE reflects standard error.

* $p < .05$; ** $p < .01$.

in private schools hold a regular certification. This descriptive finding links to an inferential finding related to certification status.

We turn now to the results regarding the research question about the effects of induction programs on teacher turnover with only avoidable turnover teachers (excluding involuntary and unavoidable turnover teachers). After controlling for teacher characteristics and school char-

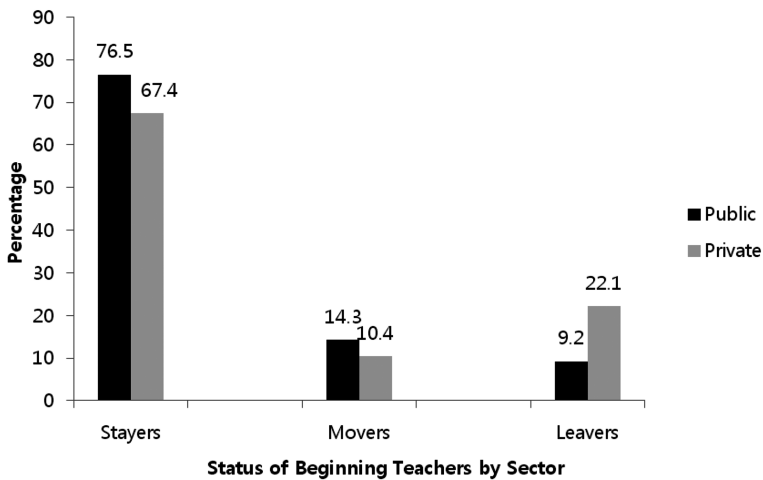


FIGURE 1 Final status of beginning teacher after one year of teaching by sector (weighted).

acteristics, the analyses revealed that only three induction activities had an impact on reducing the likelihood of leaving: seminars, common planning time, and receiving extra classroom assistance. First, participation in seminars or classes for beginning teachers was associated with a 33% ($rr = .67, p = .03$) reduction in the likelihood of moving holding all of the other variables in the model constant; the coefficient is statistically significant at the 95% level of confidence (see Table 6). The rr reflects the relative risk ratio of moving as opposed to staying. The same activity was associated with a small increase in the likelihood of leaving, holding all of the other variables in the model constant; however, the coefficient was not statistically significant ($rr = 1.12, p = .64$). In other words, participating in seminars was positively related to reducing teachers moving to another school but not to leaving the profession.

Having common planning time with teachers in the same subject was associated with a 27% ($rr = .73, p = .09$) reduction in the likelihood of moving; the coefficient is statistically significant at the 90% level of confidence (see Table 6). The same activity reduced the likelihood of leaving, but was not statistically significant ($rr = .81, p = .46$). It means that beginning teachers who had a planning time with colleagues showed less tendency to move to another school than other teachers who did not have the practice. Besides, having common planning time did not influence beginning teachers leaving the profession.

TABLE 6 Relative Risk Ratio of Induction Activities (Weighted)

	Movers		Leavers	
	rr^1	p	rr^1	p
Seminars	0.67	0.03**	1.12	0.64
Collaboration	0.77	0.17	0.74	0.24
Planning time	0.73	0.09*	0.81	0.46
Supportive communication	0.83	0.30	0.70	0.27
Reduced schedule	0.76	0.45	1.13	0.83
Reduced preparations	1.01	0.98	0.78	0.69
Extra classroom help	0.57	0.00***	0.60	0.15
Observational visits	0.93	0.74	0.978	0.94
Teacher network	0.79	0.25	1.57	0.21

Note. ¹Relative risk ratio (rr) of each type of induction activity is calculated after controlling for teacher and school characteristics. rr reflects the relative risk of moving or leaving as opposed to staying.

* $p < .1$; ** $p < .05$; *** $p < .01$.

Another induction activity was receiving extra classroom assistance, such as the provision of teacher aides. This activity had a strong relationship to beginning teacher turnover in reducing the risk of moving by 43% ($rrr = .57, p = .00$). This coefficient is statistically significant at the 99% level of confidence. The same activity was associated with a 40% ($rrr = .60, p = .15$) reduction in the risk of leaving; but was not statistically significant. Again, when beginning teachers received extra classroom assistance, they are more likely to stay in the same school after 1 year later. However, the induction activity did not show any influence on reducing the rate of leavers. All other induction activities revealed some influences on either reducing or increasing the likelihood of moving or leaving, but none of the coefficients were statistically significant (see Table 6).

Implication

This research has been conducted to enhance the understanding of induction programs on beginning teacher turnover. Four induction activities were found to be commonly practiced associated with first-year teachers: supportive communication, regular-scheduled collaboration, seminars, and common planning time. The SASS and TFS, however, did not allow for judgments to be made about the quality or depth, of these induction activities, nor were they well described.

There were some limitations of this study to note. One major limitation was that induction activities were surveyed with yes-no questions. If more detailed information about induction activities had been collected, a better understanding of the effects of induction programs on teacher turnover would have been possible. Second, involuntary turnovers were treated as one group in this study. But this group included several different subgroups: those who were laid off, those with health issues, and those who began retirement, to name a few. Treating them as a homogenous group, as we did in this study, was less than desirable. Third, beginning teachers in this study were defined as first-year teachers. If turnover information for second- and third-year beginning teachers were collected, a better understanding of the influences of induction would have been possible. Fourth, this study did not consider economic conditions related to teacher turnover, and we are sure that this plays a role in beginning teachers' choices about staying, moving or leaving. Similarly, the characteristics of the students taught are also likely to influence the decision to stay, move or leave, but these data were not available for analysis.

Nevertheless, three induction activities showed influence on reducing the rates of turnover for beginning teachers: (a) Extra classroom assistance reduced the risk of moving and appeared to be the most powerful induction activity in reducing the risk of moving; (b) participation in seminars reduced the likelihood of moving, and (c) common planning time showed an impact on reducing the likelihood of moving. This finding has some similarities with what Wong, Britton, and Ganser (2005) found through their research. The researchers determined that high-quality induction programs have three major similarities; highly structured, focused on professional learning, and collaboration. The obvious recommendation from this study is that education policy makers, teacher educators, and school administrators should know these needs of beginning teachers and support them with systematic structure of programs and training. Simply offering various induction activities is not enough to persuade beginning teachers to stay. Understanding beginning teachers' needs should be the very first step to take and then we could support them wisely.

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