

TEXAS TEACHER SHORTAGES: SOLUTIONS OFFERED BY AN EXAMINATION OF THE 2013 TEACHING AND LEARNING INTERNATIONAL SURVEY (TALIS)

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Abstract

The short blog post “How the Teacher Shortage Could Turn into a Crisis” examined the increasing difficulty of recruiting and retaining high quality teachers (Weingarten, 2016); which is appearing in Texas as teacher preparation enrollment has decreased. Teacher recruitment and retention is a multi-tiered issue which requires an examination of numerous variables; including job satisfaction and individual teacher characteristics. Researchers have examined teacher attrition and job satisfaction through the lenses of motivation and organizational commitment. The 2013 Teaching and Learning International Survey (TALIS) data was used for this study, which analyzes correlations between general demographics, work experience, participation in a teacher training programs, professional development, and satisfaction with teaching as a career choice. Survey items were selected and explored using factor analysis to determine if there are relationships between gender and age of respondent, years of teaching experience, completion of teacher preparation program, mentorship and professional development, and job satisfaction or professional regret. Initial analysis hints that teacher preparation programs, mentorship, and professional development are correlated to job satisfaction and teacher regret. These are factors that can be addressed with the goal of reducing teacher attrition and increasing teacher candidates in the state of Texas and beyond.

Keywords: teacher shortage, teacher attrition, TALIS data, teacher job satisfaction

This study examined the second Teaching and Learning International Survey (TALIS), administered in 2013, to determine if the type of education and training teachers receive is correlated to their level of job satisfaction. The advantage of exploring these relationships using the TALIS is the large, multinational sample size which provides a broader perspective into the teacher experience. The TALIS questions allow researchers to derive self-efficacy; which according to Bandura (1997), is linked to higher motivation, setting high goals, and demonstrating strong commitment to tasks. Furthermore, self-efficacy is associated with regulating mood and stress (Bandura, 1997), and reduced stress is correlated to a decrease in teacher burnout and an increase in job satisfaction (Grayson & Alvarez, 2008). Job satisfaction is a latent construct which may be determined relationally by looking at more measurable factors; such as teacher work load, compensation, and teacher experience and preparation (Klassen & Chiu, 2011). Pearson and Moomaw (2005) examined factors contributing to job stress which relates to teacher job satisfaction, and found that increased teacher autonomy coupled with more administrative support was positively correlated with job satisfaction. Texas teacher educators and school administrators should strive to increase recruitment and retention by implementing policies that address these factors.

Statement of the Problem

For the past few years, education researchers and stakeholders have been noticing a downward trend in teacher education enrollment (Sawchuk, 2015); alongside an increasing teacher attrition rate (Klassen & Chiu, 2011). Student success and achievement has a reciprocal relationship to teacher motivation and self-efficacy (Cheng, Tang, & Cheng, 2015). Moreover, the teaching profession is essential to the economy, using the classic economic model, an uneducated population will earn less income over a lifetime creating a vast gap in wealth and earnings throughout the global population. Since job satisfaction is a latent construct related to work conditions and self-efficacy ratings correlate to training, preparation, and experience (Arsal, 2014) these factors should be explored in connection with job satisfaction and professional regret. In other words, can teacher retention and recruitment be increased by addressing issues related to job satisfaction and self-efficacy?

Purpose of the Study

The purpose of this study is to support previous research by investigating factors of teacher attrition, burnout, and recruitment; while providing points of discussion for addressing the issue of teacher shortages in Texas. Additionally, this study will add to the present literature by including a multinational perspective. Teacher characteristics, teacher training and preparation, mentoring and professional development, and job satisfaction and professional regret are commonly experienced by teachers working in the 34 countries which contributed data to TALIS

Significance of the Study

Existing literature provides a grim picture of the teaching profession citing an increase in teacher attrition and decreases in new teacher graduates (Klassen & Chiu, 2011; Sawchuk, 2015). This study will contribute to extant research by providing a global perspective to the constructs of job satisfaction and professional regret; which are both connected to teachers deciding to leave the profession and the recruitment of teacher candidates (Klassen & Chiu, 2011). By understanding the relationships between the factors that contribute to these phenomena; teacher education programs and education administrators in Texas and elsewhere can form policies which will mediate negative aspects of the profession, increase individual self-efficacy, and increase positive support of new and inservice teachers.

Research Questions

Based on the 2013 TALIS data, the recently highlighted issue of teacher attrition rates, and research suggesting that teachers with a positive working experience also positively affect student achievement; I have composed the following research question(s):

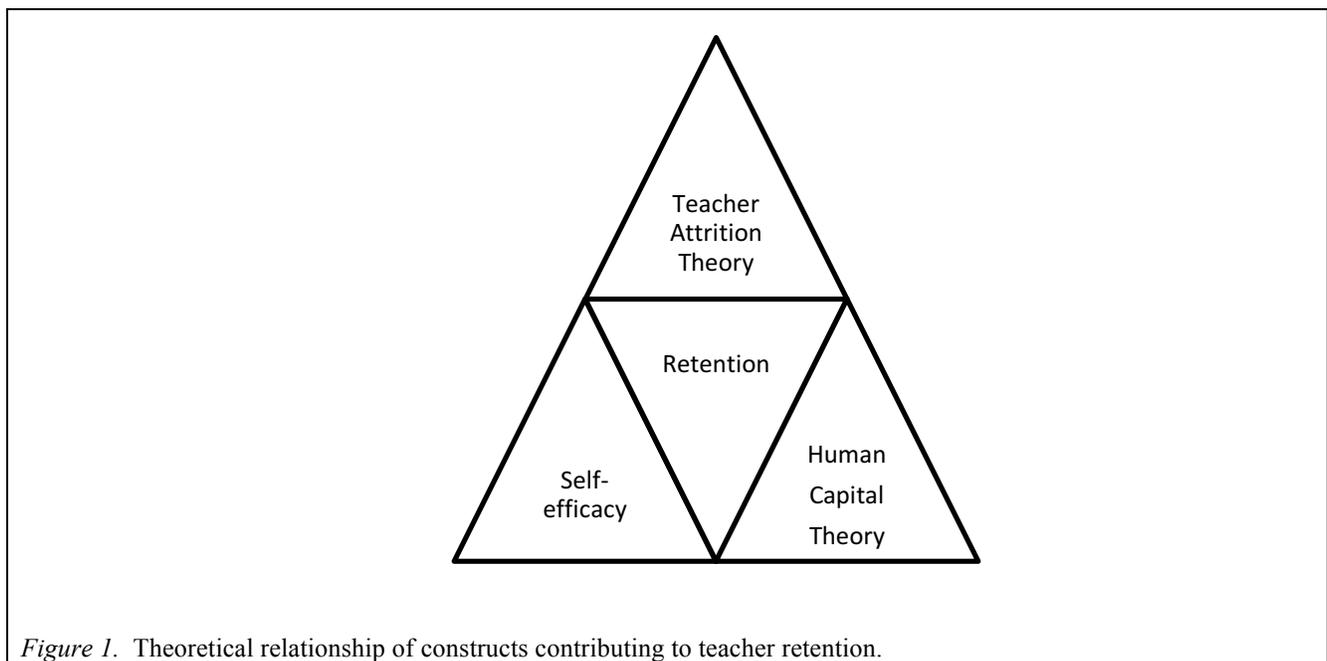
1. Are there underlying factors explaining the characteristics of teachers that are satisfied with their teaching career compared to the characteristics of those that regret entering the teaching profession?
2. Does participation in a teaching training program correlate to job satisfaction? As in, did satisfied teachers receive more training in content, pedagogy, and classroom practice than dissatisfied teachers?
3. Does the participation in a mentorship or first-year teaching support program positively affect the level of job satisfaction among teachers?

These three research questions are broad, and dependent on less measurable factors such as motivation, self-efficacy, and burnout. Therefore, these questions will be addressed by searching for some underlying variables that may more clearly define their relationship.

Theoretical Framework

Teaching is a profession that may be examined through the lens of human capital theory; viewing it simply as a function of salary, benefits, and other non-fiscal aspects of the official job offer (Kirby & Grissmer, 1993). In this model, teacher attrition would be considered economically via cost-benefit analysis of the teaching position versus alternative

opportunities, which may help explain the characteristics of those individuals which opt to enter the profession (Kirby & Grissmer, 1993; Guarino, Santibanez, & Daley, 2006). However, research of teacher attrition suggests job characteristics which emerge after-hire are also involved in the decision to leave or stay in the profession (Somech & Drach-Zahavy, 2000). Kirby & Grissmer (1993) describe these factors as experience characteristics; which includes types of students, administrative workload (Somech & Drach-Zahavy, 2000), and professional support, and these attributes provide the basis for their teacher attrition theory. Teacher attrition theory posits as experience characteristics increase teacher attrition rates will also increase as a function of job dissatisfaction (Kirby & Grissmer, 1993). In addition to economic theory and teacher attrition theory, Bandura's (1997) self-efficacy theory connects motivation, mood and stress regulation, and commitment to high perceived self-efficacy among individuals. Klassen and Chiu (2011) connect high self-efficacy to occupational commitment among teachers. Therefore, an interplay of these three theories provide a logical framework for detailing the experience of an individual from preservice training, developing self-efficacy, experiencing job satisfaction, and occupational commitment (Figure 1).



Literature Review

Teacher Recruitment and Retention

There are indications that fewer and fewer post-secondary students are choosing teaching as a profession, as explained by Sawchuk (2015) the greatest declines are being recorded in the largest states; including Texas. Explanations range from the economic budget reductions of 2008 to the increase in accountability and performance pay raising wariness among potential education professionals (Sawchuk, 2015). Sawchuk (2015) also reported that researchers and policymakers are concerned that the public perception of teaching has become more negative, specifically surrounding teacher evaluations, more academic standards, and lack of teacher support. These factors have also been considered as contributing variables to teacher attrition studies, like one from Klassen & Chiu (2011). Klassen and Chiu (2011) performed a factor analysis of survey results from teachers to determine intention to quit, occupational commitment, and job satisfaction. Analysis revealed that practicing teachers have lower occupational commitment and higher levels of intention to quit, corroborating the inverse relationship between teachers' perceived stress and occupational commitment (Klassen & Chiu, 2011). Sawchuk (2015) noted Science, Technology, Engineering, and Mathematics (STEM) teachers are in highest demand but have the weakest

enrollment in teacher preparation programs. Adding to this shortage Klassen and Chiu cite a Guarino, Santibanez, and Daley (2006) report that teachers in STEM fields were more likely to leave teaching than their peers teaching other subjects.

Teaching and Learning International Survey

Clearly, U.S. education will be facing a teacher recruitment and retention challenge, but this shortage extends to other countries as well. Therefore, multinational bodies including the Organization for Economic Cooperation and Development (OECD) are working to provide researchers with international data to help shape education policy for positive improvement. OECD states its “[mission] is to promote policies that will improve the economic and social well-being of people around the world” (Organization, 2016a, para. 1). As part of its mission, OECD administered the most recent TALIS in 2013 with findings representative of more than five million teachers in 34 countries to provide data concerning learning environment, feedback and evaluation, pedagogy and classroom environment, support and professional development, school leadership, and job satisfaction and self-efficacy (Organization, 2016a). TALIS is the only international survey available to researchers which encompasses a range of education issues, and the Teachers in Focus Brief reports that teachers in most countries spend the first five years of teaching in challenging working conditions and have less confidence than more experienced teachers (Organization, 2016b).

Job Satisfaction

Klassen and Chiu (2011) discussed the relationship between job stress, intention to quit, and self-efficacy noting that confidence in capabilities is related to job satisfaction and commitment to the profession. Various factors have been linked to job stress, Pearson and Moomaw (2005) performed a study to determine the effect of teacher autonomy and empowerment on teacher stress levels and increased motivation, and concluded that these characteristics are linked to teacher commitment and teacher professionalism. On the other hand, job dissatisfaction leads to stress and ultimately to burnout, and is the culmination of three dimensions; emotional exhaustion, depersonalization, and personal accomplishment (Pearson & Moomaw, 2005; Grayson & Alvarez, 2008). Grayson and Alvarez (2008) found that as schools increased the amount of time provided for teaching duties and learning activities and reduced interruptions from administrative tasks teacher, self-efficacy, and personal accomplishment positively increased. An increase in both self-efficacy and personal accomplishment would enhance job satisfaction, a key marker of occupational commitment (Arsal, 2014; Klassen & Chiu, 2011).

Characteristics of Teacher Attrition

Kirby and Grissmer (1993) provided a framework for examining teacher attrition so policy makers could consider job aspects beyond strictly economic incentives. Experience characteristics are those that emerge after a teacher gains experience at the school site, and include student characteristics, level of administrative tasks, and professional support (Kirby & Grissmer, 1993). This model is particularly useful to examine teachers that have been in the profession for five years or less, however, other changes come into play between teachers’ personal lives and school administrative changes (Kirby & Grissmer, 1993). The longitudinal study performed by Kirby and Grissmer (1993) produced a U-shaped relationship for age and attrition, with young teachers leaving at high rates similar to those nearing retirement. Considering the decreasing enrollment in teacher preparation programs this pattern of attrition harbingers major challenges for education policy-makers and school administrators (Sawchuk, 2015).

Methods

The aim of this study is to identify underlying constructs within the TALIS data among the variables describing teacher demographics, participation in teacher training program, and new teacher mentoring as they are related to job satisfaction and professional regret. Teacher job satisfaction and professional regret have been related to teacher attrition in previous studies including Klassen and Chiu (2011), Guarino, Santibanez, and Daley (2006), Grayson and Alvarez (2008), but the variables that inform job satisfaction and professional regret are not completely understood. In order to define the complexities of these types of latent constructs, a large sample size is needed in conjunction with a multitude of validated

survey items which will inform researchers of measurable variables related to these topics. Fortunately, the 2013 TALIS data set serves as a reliable secondary data source for researchers, and was utilized for this study to provide a global lens to the issue of teacher shortages and attrition.

Participants

According to the standards set forth by the TALIS Board of Participating Countries, participating schools and teachers were based on scientifically drawn samples that would be representative of each country's teachers and students (National Center for Education Statistics, n.d.). It was determined that "in order to represent the country accurately and reliably, each country must sample at least 200 schools" (National Center for Education Statistics, n.d.). These schools were randomly drawn, and the school principal along with up to 22 teachers were asked to complete the survey with response rates varying by country. The participants were teachers of various subject areas at all levels, denoted as K-12 in the United States; however, TALIS uses the International Standard Classification of Education (ISCED) to determine teaching level (OECD, 2014). The 2013 survey focused on Level 2 classification; which is lower secondary education or middle school and junior high, although there were a number of Level 1, primary education teachers and Level 3, secondary education teachers (OECD, 2014). A combined sample size of 147,399 was included in the analysis. It is important to note that teachers that teach adults only, special-needs only, part-time, or out on leave were excluded from the survey (OECD, 2014).

Materials

Participants could complete either a paper and pencil or online version of the questionnaire, and no personal information was required. The data is available for public use, and can be downloaded on the National Center for Education Statistics (NCED) or OECD website in the form of an SPSS data file. The data from the United States is not included in all of the survey items because the response rate did not meet the requirements; however, the data is included in the TALIS international public use data files. For this study, data files were downloaded into spv- files and analyzed using IBM SPSS version 23.

Procedure

Initially, TALIS items were selected based on their relationship to the latent factors of job satisfaction, self-efficacy, and teacher attrition; specifically, variables described in similar studies were compared to TALIS survey items. Variables that were highly correlated were then excluded to reduce multicollinearity, such as Items 5a, 5b, 5c, and 5d, "How many years of work experience do you have?" broken into a) years at the surveyed school, b) years total, c) years working in other realms of education, and d) years working other jobs. For the purposes of this investigation, only 5b, years working as a teacher in total, was included in the analysis (Field, 2013). This process was repeated for each of the first round of selected items.

A total of 17 survey items were ultimately chosen to most closely represent the underlying constructs, and these provided information on teacher age, years of experience, participation in a training program, self-report of feelings of preparedness, teacher mentoring, and job satisfaction (Appendix A). Finally, following recommendations for exploring correlations between data, the statistical analysis chosen was principal axis factoring using the following criteria; Kaiser-Meyer-Olkin (KMO) measure, eigenvalues greater than 1, and oblique rotation (Field, 2013). This exploratory factor analysis was chosen to "reveal any latent variables that cause the manifest variables to covary," (Costello & Osborne, 2005). Using IBM SPSS version 23, survey items were selected for factor analysis, along with the KMO test for sphericity, and anti-image correlation matrix to test assumptions. Eigenvalues were set at greater than 1 to exclude factors that do not explain any more variance than adding a variable, and Varimax orthogonal rotation was selected to reduce the number of variables with high loadings on a single factor (Field, 2013).

Results

A principal axis factoring analysis was conducted on the 17 items with oblique rotation, and the KMO = .70 which verified the sampling is adequate for analysis along with Bartlett's test of sphericity significant at $\chi^2(136) = 60343.16$, $p < .001$. The correlation matrix revealed that 14 of 17 items correlated at least .3 with a minimum of one other item, suggesting reasonable factorability (Neill, 2008). After reviewing the eigenvalues and scree plot, the first five factors explained 45 percent of the variance, therefore these factors were extracted for subsequent analysis. Five factors were retained, Table 1 shown in Appendix B provides the rotated factor loadings, and each item with a criterion level of .40 or greater demonstrates strong correlations for those factors. The items that cluster for the same factor indicate that factor 1 reflects motivation, factor 2 represents self-efficacy, factor 3 is representative of empowerment, factor 4 relates to occupational stress, and factor 5 represents peer relations.

Age and experience items had strong correlations with motivation. Kirby and Grissmer (1993) noted the U-shape pattern of attrition implying that middle career and more experienced teachers have more job-related motivation. Self-efficacy related to survey items about teacher preparedness and formal training programs, an institution that supports teach autonomy and support will increase teacher and organizational commitment (Klassen & Chui, 2011). Klassen and Chui also noted that these factors were related to teacher empowerment, and were noted in survey items about new teacher induction programs and school climate. Occupational stress and peer relations overlapped with school climate and professional development, these activities define an organizations commitment to supporting teacher professionalism, a key factor in teacher retention; according to Kirby and Grissmer (1993). These constructs are important indicators to those examining teacher attrition and retention, and the commonality found in the TALIS implicates that teachers, globally, experience these issues within their unique school systems (Guarino, Santibanez, & Daley, 2006).

Discussion

It is important to begin to understand what motivates an individual to enter the teaching profession, both age and experience had high factor loadings under factor 1; .95 and .87, indicating that there are some shared characteristics for those that chose to become teachers and remain in the profession (Guarino, Santibanez, & Daley, 2006). In other words, this analysis suggests that there are some underlying motivators that are shared which should be explored future analyses. Teachers experienced various types of preparation for pedagogy, content, and classroom practice and these variables shared factor 2 loading at -.92, -.81, and -.80 respectively supporting high self-efficacy for teachers participating in a structured teacher preparation program (Skaalvik & Skaalvik, 2010), this finding is supported by the formal training items which all loaded significantly under factor 3. In addition to these findings, self-report of job satisfaction and career regret loaded at -.85 and -.50 under factor 4 suggesting that occupational stress correlates with these variables. Teachers participating in mentoring or induction activities experience more peer relationships or factor 5, and all items loaded $>.4$.

Limitations

There are a number of limitations in this study, including the potential for high multicollinearity between variables due to the nature of the survey items; this also may be due to the subjective nature of item selection (Beavers et al., 2013). However, individual items were chosen based on a strong theoretical framework and then deleted or included based on appropriate data prescreening procedures which should have negated these effects (Fields, 2013). In addition, a number of the survey items offer interval or ordinal data rather than continuous measures, and the literature is not in agreement on the appropriate use of this statistical method on such data (Beavers et al., 2013). However, the number of research papers utilizing this method increases confidence that statistically significant analyses can be performed.

Implications

This analysis supports the premise that teachers around the globe are struggling with similar issues that may cause a teacher to leave the profession, and that these issues should be explored in future studies. Considering the current teacher

shortages, teacher educators need to define the impact of candidates' age and experience when forming recruitment programs, in addition to the structure of the program itself. For example, the high numbers of attrition among young teachers may point to a need to recruit individuals from other occupations that are in midlife and more interested in changing to an altruistic career with positive experience characteristics (Klassen & Chiu, 2011).

In general, teaching as a profession lacks prestige and economic compensation lags behind other opportunities of equivalent education and experience; therefore, these factors should be explained during recruitment. Future research may explore the alignment of expectancy-value theory with teacher education enrollment and teacher attrition in order to ascertain how economic factors play a role in individuals choosing teaching as a lifelong career. Additionally, this analysis points to stress as being a dominate factor for job satisfaction and intention to quit (Klassen and Chiu's 2011; Pearson and Moomaw 2005) indicating future research should attempt to identify specific sources of stress which could be addressed by school administrators, districts, and other governing bodies. For example, a significant mitigator of stress are supportive activities and programs; such as mentoring and teacher induction (Hoy & Spero, 2005). Hoy and Spero performed a longitudinal study to assess changes in self-efficacy from preparation through student-teaching, and finally the induction year, and the results indicated that self-efficacy ratings decreased at the end of the induction year. The connection between responses concerning peer relations, mentoring, and induction activities should explored further to identify best practices of supporting preservice and new teachers (Guarino, Santibanez, & Daley, 2006; Pearson & Moomaw, 2005).

Conclusion

The purpose of this exploratory factor analysis study was to discover the number of latent constructs contributing to variables which are theoretically related to teacher attrition and retention. Factor loadings suggests that motivation, self-efficacy, empowerment, occupational stress, and peer relations can explain relationships of those survey items, confirming the first research question that there are shared characteristics among teachers that are satisfied in their current positions. The second research question is addressed by factor 3, which suggested that teachers with formal training in pedagogy, content, and classroom practices are more empowered in their current positions. Empowerment, according to Pearson and Moomaw's (2005) investigation, leads to both job satisfaction and occupational commitment; which are increasingly important factors with teacher shortages looming. The final research question concerning the effect of mentor programs on job satisfaction is less clear with the most significant factor loading factor 3 (empowerment) = .35. However, the survey items point to a relationship between teachers that have participated in mentoring or induction activities (Appendix B).

Teaching is a multifaceted, complex profession, and research regarding teacher attrition and retention should attempt to tease apart these complexities so policies and teacher education programs can more accurately reflect the needs of our current education system. Darling-Hammond (2010) explains that the power to transform teaching and learning lies within teacher preparation. Buchanan's (2012) study examining the reasons teachers choose to leave the classroom indicated that mentoring would have altered early classroom teaching experiences for those that chose to leave the profession. It is possible to utilize data from sources such as TALIS to determine ways that teacher recruitment activities and teacher preparation programs can address needs of future teachers to help them remain in the classroom. The implication is significant, "as measured by the teacher scores on a licensing examination, along with teachers' experience and education—had more powerful effects on student achievement than socioeconomic status" (Ferguson, 1991 as cited in Darling-Hammond, 2010, p. 39). In other words, in order to make positive impacts on student success in Texas, and across the United States, methods must be put in place to prepare and support high quality teachers which may increase the likelihood of retaining them in the classroom.

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Appendix A
Survey Results

Variable	Item	Item	Item
Gender	TT2G01		
Age	TT2G02	—	
Experience	TT2G05B		—
Teacher Program	TT2G11		
Teacher Preparedness	TT2G12A	TT2G12B	TT2G12C
Self-Report Preparedness	TT2G13A	TT2G13B	TT2G13C
Participation in Induction Program	TT2G19A	TT2G19B	TT2G19C
Mentoring activities	TT2G20A	TT2G20B	
Job Satisfaction	TT2G46J		
Job Regret	TT2G46D		

Appendix B

Results from Exploratory Factor Analysis for the SPSS Analysis of TEACHING AND LEARNING INTERNATIONAL SURVEY Items (N=12708)

	Rotated Factor Loadings				
	1	2	3	4	5
Background/ How many years of work experience do you have?/ Year(s) working as a teacher in total	.95	.04	-.08	-.02	.03
Background/ How old are you?	.87	.07	.04	-.01	.06
Background/ Prepared for elements in teaching/ Pedagogy of the subject(s) I teach	-.03	-.92	.02	.03	-.03
Background/ Prepared for elements in teaching/ Content of the subject(s) I teach	-.04	-.81	-.01	.04	-.01
Background/ Prepared for elements in teaching/ Classroom practice in the subject(s) I teach	.00	-.80	.014	.01	-.02
Background/ Are you female or male?	-.00	.06	.04	.04	-.04
Background/ Elements included in formal education or training/ Pedagogy of the subject(s) I teach	.02	-.05	.87	.02	.05
Background/ Elements included in formal education or training/ Content of the subject(s) I teach	-.00	-.06	.83	.00	.04
Background/ Elements included in formal education or training/ Classroom practice in the subject(s) I teach	.04	.02	.71	.01	.05
Background/ Did you complete a teacher training programme?	-.03	.03	.35	-.05	-.02
School Climate/ About your job/ All in all, I am satisfied with my job	.03	.00	.08	-.85	.01
School Climate/ About your job/ I regret that I decided to become a teacher	.01	-.04	.01	.50	.03
Professional Development/ Participation in programmes/ I took/take part in general and/or administrative introduction	.01	-.03	.05	-.03	.59
Professional Development/ Participation in programmes/ I took/take part in an induction programme	.02	.04	-.00	.05	.49
Professional Development/ Participation in programmes/ I took/take part in informal induction activities	-.00	-.02	.03	-.01	.42
Professional Development/ Involvement in mentoring activities/ I presently have an assigned mentor to support me	.16	-.01	.01	.05	.21
Professional Development/ Involvement in mentoring activities/ I serve as an assigned mentor for one or more teachers	-.12	.07	-.00	.01	.13