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Teenage learners and teachers' job satisfaction in vocational education

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Abstract

An increasing number of adult basic skills teachers in England have a large proportion of teenage learners in their classes. In this paper, we explore whether this development affects their job satisfaction. We draw on longitudinal data of teachers involved with basic skills provision. Using a range of statistical models, our main finding is that adult basic skills teachers who face more teenagers in the classroom are less satisfied with their experience of learners than those who teach mainly adults.

Keywords: Teachers, job satisfaction, literacy skills

1. Introduction

The problems of low numeracy and literacy levels for a large proportion of the UK adult population have been documented at key points in the last two decades (e.g. the 1999 Moser Report, the 2003 Skills Survey and the 2006 Leitch report). In 1999, it was documented that approximately 20% of adults in England had severe literacy difficulties, whilst around 40% had some numeracy problems. Having poor literacy and/or numeracy is harmful both to low-skilled individuals (who are at greater risk of unemployment, unstable jobs and fewer prospects for career advancement) and to the economy at large (that increasingly needs a more highly qualified workforce).

Before 2003, teachers in this area of work may or may not have had professional qualifications in their own subject. A variety of certificates and diplomas were available. After that, from 2003 to 2007, the first phase of qualifications for specialist teachers of adult literacy, numeracy and ESOL¹ were introduced.

An interesting consequence of current policy is that a third of existing basic skills teachers in England teach to groups containing a majority of teenage learners (age 16 to 19) and more than half of the qualifications counting towards government targets between 2001 and 2007 were gained by teenagers (16-18 years old)². There are numerous reasons why teaching teenagers might be considered as a distinct experience from teaching other post-compulsory education learners beyond this age range.

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¹English to Speakers of Other Languages

²See National Audit Office (2008)

Given that many of these teachers find themselves in classrooms with a high proportion of teenage learners, we investigate whether this development affects their job satisfaction. More specifically, we investigate the link between the satisfaction of teachers towards their learners and the proportion of teenage learners in their classrooms.

Rich micro-level data are provided by the National Research and Development Centre for Adult Literacy and Numeracy (NRDC), who have conducted a longitudinal study of adult literacy and numeracy teachers in England over the period 2004 to 2007. Our empirical strategy relies on two approaches. We first introduce a large number of potential confounders in our regressions. And the data sets being a panel, we are also able to account for time constant unobserved heterogeneity in our estimations.

Assuming that a lower level of satisfaction is associated with higher quitting rates, our findings have important implications for basic skills teachers' attrition from the profession. Teacher attrition has serious negative consequences. It affects learners first and foremost, as they are more likely to be taught by novice teachers and the lower quality of teaching by novice teachers is well documented (Hanushek, Kain & Rivkin, 2005; Clotfelter, Ladd & Vigdor, 2006). Secondly, it also affects government spending, as from high attrition rates follow increased training costs. Thirdly, it is potentially costly to teachers who drop out, as their investment in training is lost in the process (there are also psychological costs induced by the shift to another job).

The layout of the paper is as follows: in Section 2, we provide contextual information on the recent skills strategy in England (Skills for Life) and review the literature on job satisfaction and teacher attrition. In section 3 we present the data that are used in section 4 for the empirical analysis. We summarise and discuss our results in section 5.

2. Theory and context

The Skills for Life (SfL) strategy

Publicly funded adult literacy, language and numeracy learning in England has been dominated by the SfL strategy in recent years. Set out by the UK Labour government in March 2001, the aim of the strategy has been to improve adult literacy and numeracy skills in England (Appleby & Bathmaker, 2006). Whilst the aim of the strategy is to explicitly improve *adult* skills, the SfL strategy is set out to cater for the needs of all post-16 learners³. Skills for Life provision covers all literacy and numeracy learning from pre-entry level up to and including level 2 (see appendix A for an explanation of these stages of the National Qualifications Framework). This includes every type of provision in a wide range of contexts. Where teaching and learning

³The Skills for Life targets cover people aged 16 and over in England who have left compulsory education, excluding students in school sixth forms, but including those in sixth form colleges (NAO, 2004).

in the 1980s and early 1990s may have been mainly in "adult basic education" and delivered in the community or adult colleges, SfL is now a feature of Further Education college, workplace, work-based, offender, learndirect, community, Jobcentre Plus and other types of provision. SfL may be delivered as stand alone, as part of a vocational programme, or as a "bolt-on" course. SfL targets for achievement of qualifications are at Entry Level 3, Level 1 and Level 2. But Entry Level 1 and 2 and Pre-Entry courses are also publicly funded.

An important element of the SfL strategy is the improvement of teacher qualifications as well as an increase in the number of teachers holding these qualifications. However, until recently there were few professional development guides or programmes preparing teachers for engaging with teenage rather than with adult learners.

Teacher exit attrition and job satisfaction

This paper focuses on one potentially important contributor to the rate or turnover among SfL teachers in England, namely job satisfaction. Limited information is available as to the rate of turnover among SfL teachers in England. However, almost every major evaluation or survey cites it as a problem (Smith & Hofer, 2002). Much of the literature referred to below comes from American research as there is a relative paucity of work in the European context.

Attrition is to be avoided given the overall general problems of teacher supply in England, particularly in mathematics and English language (see White, Gorard & Huat, 2006). Teacher attrition can cause financial hardship to the employing organisation due to a channelling of scarce resources toward recruiting, hiring and attracting new prospective teachers and providing training. In addition, high teacher turnover has negative impacts on student learning (Hanushek et al., 2005; Clotfelter et al., 2006).

The market for teachers generally can be said to differ from that of a well-functioning neoclassical labour market. This is because salaries are determined not by the market clearing level, but instead through a political process involving several levels of government and often teachers' unions (Mont & Rees, 1996). Thus, a shortage of teachers becomes a possibility, or at least of appropriately trained teachers (Mont & Rees, 1996). An important issue for the UK government is how to provide enough reward, monetary or otherwise, to induce high quality individuals to stay in the profession, specifically those teachers with the hardest jobs (Chevalier & Dolton, 2005)⁴. Compensating the non-satisfied teachers with a higher wage would be the standard labour economics approach. Increased teacher salaries are also associated with increased teacher quality (Figlio, 1997).

Other research has claimed that the most important influence on retention decisions is job satisfaction rather than wage level (Stockard & Lehman, 2004). Voke

⁴It should be further noted that salaries in Further Education are not being set nationally but by each employer, unlike the compulsory education teaching scales.

(2002) notes that new teachers enter the profession primarily for intrinsic rather than extrinsic rewards. That is to say, they want to become teachers for the opportunity this will give them to engage in meaningful work, or for the love of a particular subject, for example, rather than for salary or status (Lortie, 1975; Goodlad, 1984; Liu, Kardos, Kauffman, Peske & Johnson, 2000). However, Voke (2002) goes on to observe that while the extrinsic rewards may not attract people into the profession, dissatisfaction with them is cited as a reason for quitting. Stockard and Lehman (2004) further note that teachers with lower salaries, as well as those who are in more "difficult" assignments, are more likely to express dissatisfaction or leave teaching (Billingsley, 1993; Murnane, Singer, Willet, Kemple & Olsen, 1991; Stinebrickner, 1998). When receipt of intrinsic rewards is thwarted, through, for example, discipline problems (which in our case is more likely to happen given the increasing presence of teenage learners), teachers become less willing to tolerate the low salaries. Compulsory education teachers in England get paid more than post-compulsory education teachers. Indeed graduates within the Further Education sector are paid less than any other graduates in regressions that control for large numbers of potential confounders (i.e. sectors of activity, degree specialisation, highest qualification attained and the usual socio-economic: age, gender, ethnicity, marital status), see Walker, Vignoles and Collins (2007). This may be compensated for by the nature of the audience. Adults are less cost intensive to teach than children. It may reflect the increased desirability as an intrinsic motivation to teach adults. If this intrinsic motivation is thwarted, financial compensation may become more important. Work by Imazeki (2005) suggests that salary increases can reduce exit attrition, but that these increases need to be fairly substantial. Thus, with regard to reducing exit attrition, the most efficient strategy is to ensure that the intrinsic rewards, such as satisfaction with learners, are retained.

Appropriate professional development has been identified as a crucial factor in reducing teacher attrition (see Comings & Zachry, 2006 and Latham & Vogt, 2007). Furthermore, asking teachers to teach outside their areas of certification has been shown to correlate with higher turnover (Mont & Rees, 1996). Many teenagers arriving in the post-compulsory education sector will have an unsuccessful career in compulsory education behind them. It may be that a teacher has left the compulsory education sector precisely to avoid teaching teenage learners. As such, it is assumed that satisfaction will be affected if they find a large proportion of teenage learners in their classes⁵.

Learners in the 16 to 19 age bracket are distinct in their learning needs from other adult learners. Furthermore, pedagogical theories suppose that adult learners are distinct from adolescent and child learners, and that teachers need to support and structure their students' learning accordingly (e.g. Knight & Sutton, 2004). Thus, the new qualifications, which are specifically targeted at adults and not teenage learners

⁵There may be other reasons why teachers teaching teenagers are less satisfied. It might be that the course materials are less relevant, or that facilities and class sizes are different. It could even be that teaching these learners is easier and so less fulfilling.

will, to some degree, fail this group of young people and fail the teacher trainees. Such inappropriate skilling appears to be happening in the basic education sector despite the rigorous new teacher training frameworks brought in by the recent SfL strategy. This is perhaps all the more surprising given an historical context where teenagers have always made up a substantial part of the constituency of vocational (or Further Education in Britain) colleges for O-Level/GCSE retakes as well as a plethora of other qualifications not typically available in the compulsory education sector (Appleby & Bathmaker, 2006).

Drawing on the literature discussed above, we set out to address whether adult education teachers experience greater dissatisfaction with aspects of their job related to their learners when their learners comprise of a greater proportion of teenagers.

3. The data

The data used in this paper are drawn from a longitudinal study commissioned by the Department for Education and Skills (now replaced by DIUS) and managed by NRDC. Research findings from this study are used to inform on-going policy development in the SfL sector. The study surveyed approximately 1000 teachers working in a range of educational programmes across England. The same teachers participated in the study over a 3-year period from 2004 to 2007. The first two waves of the Skills for Life teachers survey conducted in 2004-5 and 2006 respectively are used. The data set appears reasonably representative of the whole SfL workforce (NRDC, 2006; LLUK, 2007). Current estimates are that the entire SfL teachers workforce numbers 18,800, implying that teachers interviewed for this survey account for more than 5% of this workforce, an unusually large percentage for this type of survey. In a previous report (NRDC, 2006), this sample was compared to a sample of compulsory schoolteachers interviewed in the Labour Force Survey (LFS) over the same period. Compared to post-secondary teachers, individuals in our sample are older (5 years older), more likely to be female, have longer working hours, are more likely to be on temporary contract, and earned about 22% less.

We give the main characteristics of the sample used in waves 1 and 2 in Table 1. We observe that the sector consists largely of female teachers (80%). We also observe that across the two waves an upward shift appears in the qualification levels. A larger number (40% rather than 25%) of teachers report holding the highest recorded level of qualification in 2006⁶. This increase is not explained by attrition between wave 1 and 2 as the proportion of teachers with level 5 present in both waves was 25% in wave 1. The proportion of teachers with a temporary contract has decreased slightly (from 23% to 20%). The proportion of those with a full-time contract has also decreased (from 58% to 49%). Hourly pay has increased by 6%, which is slightly higher than inflation. Tenure is slightly lower than in the secondary

⁶But not the new professional SfL level 5 qualifications, which were not yet available during this period.

compulsory education sector, which suggests that attrition could be higher in the SfL sector (NRDC, 2006).

Table 1: Mean characteristics of the sample in wave 1 and 2

| | Sweep 1 (2004-5) (n=1027) | | Sweep 2 (2006) (n=667) | |
|----------------------------------|------------------------------|------|---------------------------|------|
| | Mean | SD | Mean | SD |
| Age | 46.5 | 9.9 | 46.8 | 9.8 |
| Female (%) | 79.2 | 1.2 | 79.8 | 1.4 |
| Ethnicity: British white (%) | 93.2 | 0.7 | 94.7 | 0.8 |
| Highest level of qualifications: | | | | |
| Level 3 and below (%) | 8.6 | 0.8 | 2.2 | 0.5 |
| Level 4 (%) | 65.3 | 1.4 | 57.6 | 1.9 |
| Level 5 (%) | 25.9 | 1.4 | 40.2 | 1.9 |
| Temporary contract (%) | 22.9 | 1.3 | 20.1 | 1.5 |
| Full-time (%) | 58.2 | 1.5 | 49.5 | 1.8 |
| Mean hourly wage | 13.5 ^a | 7.7 | 14.3 ^b | 8.9 |
| Mean paid weekly hours | 28.4 ^c | 10.8 | 28.1 ^c | 11.1 |
| Mainly teach numeracy | 48.9 | 1.9 | 43.2 | 1.9 |
| Mainly teach literacy | 37.2 | 1.8 | 34.7 | 1.8 |
| Mainly teach ESOL | 14.6 | 1.4 | 22.7 | 1.6 |
| Proportion of teenage learners | 32.4 | 38.4 | 31.9 | 37.6 |
| Taught impaired learners | 49.2 | 1.9 | 50.0 | 1.9 |

Note: ^aThis is for the 784 individuals who agreed to provide information about their earnings. ^bThis is for 444 individuals who agreed to provide information about their earnings. ^cMean paid weekly hours are 36 for full-time teachers in both sweeps 1 and 2. Similar increase in qualifications level is observed when restricting the Sweep 1 sample to the 667 interviewed in both sweeps.

For the initial sweep, 784 teachers agreed to provide information about their earnings, out of 1027. We constructed the hourly wage by dividing the income (yearly translated) by the contracted hours.

The proportion of a teacher's learners that are teenagers is captured in the data by the following question: *"In the last three months of your teaching, what has been the proportion of your learners who were age 16 to 19?"*. The teacher is then directed to choose a number on a scale between 1 and 100. The opening comment: *"In the last three months of your teaching"* has been used extensively in the data as a screening device to ensure only current and actual teachers are included in the data. The purpose of this was to exclude individuals who may have taught sometimes (and therefore were included initially) but who moved to other management or administrative positions within the sector. Whether our measure of the proportion of teenagers aptly translates as the true proportion is open to question. As this study analyses the job satisfaction of teachers, however, it is a teacher's perception rather

than the true proportion, which is of primary interest. However, to the extent that the over-estimation is constant across teachers, our slope estimates are also valid for the association between the true proportion of teenagers and teacher satisfaction. The mean proportion of all learners who are teenage learners is around 31 per cent in our sample. Behind this mean, there is considerable variability (as can be seen by the size of the standard deviation in Table 1). Approximately 25 per cent of teachers report having no teenage learners at all, while 7 per cent state that their learners are exclusively teenagers.

4. Empirical analysis

In this section, we investigate the main assumption of this paper: that SfL teachers experience greater dissatisfaction with aspects of their job related to their learners when teaching a greater proportion of teenagers. We first provide a discussion of teacher job satisfaction.

There is no agreed definition of teachers' satisfaction. It is a broad term that includes well-being, efficacy and commitment. The survey has investigated eleven aspects where teachers were asked to choose a number between 1 (very dissatisfied) and 5 (very satisfied). Satisfaction can only be addressed by the answers covered in those eleven aspects of the job (listed in Appendix B) and this paper is therefore limited in its scope as a result.

We further focus on teachers' satisfaction with their learners, which is measured in the survey by three aspects that were: "learner behaviour", "learner progress and achievement", "appreciation of your work by learners". To give a preliminary overview of the questions investigated, we provide some basic descriptive statistics in Table 2.

Table 2: Job satisfaction according to the proportion of teenage learners (%)

| | All teachers | Teachers with more than 60% of teenage learners | Teachers with less than 60% of teenage learners |
|---|--------------|---|---|
| Job satisfaction with aspects related to learners (min: 0, max: 12) | 9.3 (1.9) | 8.2 (2.3) | 9.8 (1.5) |
| Job satisfaction with other aspects unrelated to learners (min: 0, max: 32) | 17.5 (5.5) | 17.5 (5.4) | 17.6 (5.6) |

Note: Standard-errors in parenthesis. This is based on teachers self-reported proportion of teenagers they were teaching in the last three months before the interview took place.

There are differences in job satisfaction related to the learners as displayed in the first row of Table 2 (i.e. teachers' satisfaction with: learner behaviour, learner

progress and achievement and appreciation of their work by learners). Teachers with a majority of teenage learners report a lower level of satisfaction (8.2 versus 9.8 on a scale from 0 to 12).

Interestingly, this difference is absent for satisfaction with other aspects of the job. If we aggregate those in one index, we find no significant difference according to whether the teachers taught a greater or lesser number of teenage learners (second row). But one cannot draw a strong conclusion on the basis of such a descriptive table. First, the cut-off at 60% of teenage learners is arbitrarily chosen. It is important to investigate other parts of the teachers' satisfaction distribution. Second, it does not take into account other characteristics of the teaching environment that may confound this simple correlation. One obvious example could be that teachers with more teenagers are systematically situated in regions with higher levels of deprivation.

We therefore proceed to a multivariate analysis of teachers' satisfaction with their learners to include other aspects of the teaching environment. The dependent (explained) variable is the teachers' satisfaction with their learners (Table 3). The main variable of interest is the proportion of learners who are teenagers, but we include the full range of potentially confounding factors available in the data. These are: teachers' age, their highest qualifications, whether they work full-time or part-time, whether they have a fractional or hourly paid contract, whether they mainly teach numeracy, literacy or English as a second language (ESOL), whether they are on a temporary contract, white, the proportion of impaired learners, geographical region (of which there are nine⁷), the type of institutions taught at (further education colleges, adult community learning, work based learning, Job Centre plus, prisons and Learndirect). We only provide the main variables of interest in Table 3, but the full list of estimated coefficients is provided in Appendix C.

The three columns give coefficients of similar magnitude, all negative and highly significant. This means that a 10 percentage point increase in the proportion of teenage learners is associated with a 0.22 decrease in the satisfaction scale.

The other variables are introduced as controls only, we comment briefly on their estimated coefficients (shown in Appendix C). The satisfaction with learners is lower for male teachers, unrelated to age, unrelated to being on a temporary contract⁸, unrelated to the subject area (numeracy, literacy and ESOL), unrelated to teachers' ethnicity, and unrelated to the proportion of impaired learners. For the geographical region dummies, only teachers based in the West-Midlands are less satisfied with learners, but the coefficient is significant at the 10 per cent level only. Finally, those teachers in further education colleges and adult community learning appear to be less satisfied with the learners once we account for the employing organisation fixed effects (the reference group comprises work based learning, Job Centre plus, Learndirect and prisons).

⁷The 9 regions are (10 if including unknown as a category): East Midlands, East of England, London, North East, North West, South East, South West, West Midlands, Yorkshire and Humberside.

⁸In regressions (not shown) of teacher satisfaction with other aspects of the job (not related to the learners), it is negative and very significant.

Table 3: Regressions of teachers satisfaction with their learners on the proportion of teenage learners

| | | | |
|---|----------------------|----------------------|---------------------|
| Proportion of teenage learners | -0.020*** (0.002) | -0.023*** (0.007) | -0.022** (0.010) |
| Age | yes | yes | yes |
| Highest qualification levels | yes | yes | yes |
| Full/part-time | yes | yes | yes |
| Hourly paid | yes | yes | yes |
| Numeracy/Literacy/Esol | yes | yes | yes |
| Temporary | yes | yes | yes |
| Ethnicity | yes | yes | yes |
| % of impaired learners | yes | yes | yes |
| Region of teaching | yes | yes | yes |
| Type of institution (FE colleges, ACL, UFI) | yes | yes | yes |
| Proportion of teenagers squared | no | yes | yes |
| Organisations fixed effects (304) | no | no | yes |
| N | 1027 | 1027 | 1026 |
| R^2 | 0.207 | 0.208 | 0.469 |
| Adjusted R^2 | 0.188 | 0.188 | 0.229 |

Note: Figures in parenthesis are standard-errors. A table with the full list of estimates is provided in Appendix C.

Now, the question some might wish to raise at this stage is whether some characteristics unobserved in our data could explain both the proportion of teachers' satisfaction and the proportion of teenage learners in their classes. Potential candidate characteristics might include an individual teacher's personality traits such as optimism, dynamism, and/or natural ability to teach. The subsequent bias could be downward or upward depending on whether this unobserved trait is more or less attractive to teenage learners, assuming learners are able to self-select into a particular teacher's class. As we said earlier, some teachers have been interviewed twice. It is therefore possible to perform a first differenced estimation, which effectively controls for the effect of unobserved time constant heterogeneity. This allows us to investigate further potential bias in the coefficients presented in Table 3. We present these further findings in the first column of Table 4. Time constant variables disappear in the differentiation, and only time varying variables, which might explain the change in teachers (dis)satisfaction with teenage learners, remain in the regression. The coefficient for the proportion of teenage learners remains highly significant and negative, if slightly reduced in magnitude. This is consistent with Freeman (1984) and Griliches and Hausman (1986) where bias from measurement error tends to be aggravated by controlling for individual fixed effects (see Angrist & Krueger, 1999 for a discussion).

To further address the selection process by learners into a particular teacher's

class, we would need to find good instruments allowing robust IV estimations. Indeed, learners might sort themselves across different teachers. We can see two channels by which they can choose a preferred teacher. First, learners choose the subject they wish to study. Second, they can choose the institution.

An earlier version of this paper had introduced IV estimation but the instruments were not convincing enough and the analysis was dropped. We note, however, that if the subject and institution are the same for teachers over two years then our first differenced estimates take care of the kind of sorting mentioned above. We should also underline that a very large number of control variables are introduced in our regressions. For example, in Table 3 column 3, we are comparing different teachers with different proportions of teenagers within the same institutions, controlling for the type of institutions, the region, the subject taught (numeracy/literacy/ESOL) and also the usual demographic variables (age, gender, part/full - time, qualifications, etc.). It is, however, interesting to note that the coefficients in the first column of Table 4 are approximately 50% lower than the ones observed on cross-sections (Table 3), suggesting that teachers' time invariant personality traits may account for a substantial proportion of the cross-sectional effect. The effect is still highly significant at the 1 per cent level.

We also introduce a multilevel modelling (or random effects model), a popular approach in the education literature, particularly amongst social statisticians. Here we consider teachers as the level 2 units and the repeated measures as the level 1 units. The data is hierarchical in the sense that teachers (level 2) are interviewed twice (occasion 1 and 2 which are the level 1 variables).

For this model, we need to rely on the assumption that the individual effects are uncorrelated with the other explanatory variables, but it has the advantage of providing useful information on the proportion of variance due to differences between teachers and due to change over time for the same teachers. Our main coefficient of interest remains very similar (slightly increased) at -0.019 and highly significant. We also observe that only 46% of the total variance is due to the variance across teachers. This is an interesting further result as it implies that there is a significant amount of variation across years for the same teachers. The fact that this proportion is unusually low for repeated measured data comes probably from the fact that we introduced only the time varying variables because we wanted our estimates to be comparable with the other regressions in the table.

So far, our results have used a continuous measure for the proportion of teenage learners in the classroom. But is the average effect found so far hiding heterogeneous effects across the distribution?

To address this question we have split the proportion of teenage learners into four quartiles. In the first, teachers with no teenage learners are found, in the second quartile we have the teachers who have between 1 and 10% of teenage learners. The third quartile includes teachers who declared having between 10 and 75% of teenage learners, while the fourth quartile includes teachers with more than 75% teenage learners.

Table 4: Dependent variable: teachers satisfaction with their learners

| | (1) First difference estimates | (2) Random effects | (3) Non-linear effects for teenage learners | (4) First difference with non- linear effects |
|---|---|--------------------------|---|--|
| Proportion of teenage learners | -0.13*** (0.003) | -0.019*** (0.002) | | |
| Prop of teenage learners (2nd quartile) | | | -0.148 (0.173) | -0.249 (0.151) |
| Prop. of teenage learners (3rd quartile) | | | -0.882*** (0.215) | -0.646*** (0.232) |
| Prop. of teenage lear- ners (4th quartile) | | | -1.636*** (0.252) | -1.05*** (0.333) |
| Number of teachers | 661 | 661 | 1026 | 661 |
| Rho (intra unit correlation) | | 0.462 | | |

Note: Models in col. 1, 2 and 4 include the same independent variables as in the first column of Table 3. Model in column 3 include the full sets of control included in Table 3, column 3. The reference for Model 3 and 4 is teachers who teach no teenage learners (i.e. the first quartile). The second quartile includes teachers who have between 1 and 10 percent of teenagers, the third quartile includes proportions between 10 and 75 percent, and the highest quartile includes teachers with more than 75% of teenage learners.

We give in Appendix D, the average proportions of teenage learners by quartile for sweep 1 and 2, together with the total number of teachers in each quartile. We choose cut-off points in order to be as close as possible to 25% of the distribution but were constrained by the bunching at certain values. There were, for example, 26.8% of teachers with no teenage learners in the first sweep (25.8% in sweep 2).

We introduce proportion of teenage learners by quartile in Table 4, column 3 for the first sweep. We include the full set of controls used in the fully controlled regression in Table 2 (column 3). We find that the relationship between teenage learners and teachers satisfaction is highly non-linear. Teachers who face between 1 and 10% of teenagers do not express lower level of satisfaction than those without teenage learners. But teachers with a higher percentage of teenagers display a much lower level of satisfaction with their learners. This is particularly the case for teachers who have more than 75% of teenagers. Compared to teachers with no teenage students, teacher satisfaction is reduced by 1.6 units on a 12-point scale.

Another way to investigate this non-linearity is to use first differenced estimations. Here the comparison is made using teachers who face substantial changes in

the proportion of teenagers in their class across the two sweeps. The results presented in column 4 of Table 4, show again that the effect is higher at the top of the distribution, teachers who had seen their classes with more than 75% teenagers when their earlier proportion was lower are the most dissatisfied with this shift.

Another interesting aspect to investigate is whether the average effect observed using the continuous measure of teenage proportion hides substantial heterogeneity. Are particular teachers more affected than others by an increased proportion of teenagers? To address this, we introduced interactions in our fully interacted model of Table 3, column 3. We did not, however, find much support for an average effect being differentiated by characteristics such as male, age, qualifications, whether full-time, fractional or hourly paid (results not shown).

Our main finding so far is, therefore, that teachers who teach mainly teenagers are less satisfied with the aspects of their job related to their learners. Now, the question is whether this lower satisfaction with their learners is compensated in any way. One possibility could be that teachers who teach mainly teenagers are relieved from some other tasks generally not enjoyed by teachers. One way of checking that is to look at the satisfaction with other aspects of the job (not related to learners). We did underline in Table 2 that teachers with a majority of teenage learners were actually not expressing a different level of job satisfaction from those teaching to a majority of adult (not teenage) learners for aspect of the jobs that are unrelated to the learners. We can actually look at each of the 8 different items of the job satisfaction individually to check whether the overall picture is obscuring different levels of satisfaction compensating each other. We produce in Table 5, the estimated coefficients for the proportion of teenagers on the 8 aspects of the job not related to learners.

Amongst the eight aspects not related to learners, only one is significantly associated with the proportion of teenage learners. It appears that teachers who teach mainly teenage learners are on average more satisfied with the proportion of time spent on administrative tasks. The mean level of satisfaction with time spent on administrative duties is, however, the lowest amongst all aspects of the job satisfaction (mean 1.38; standard deviation 0.03). So it is actually rather that teachers are less dissatisfied with the amount of time spent on administration. This is, therefore, rather unlikely to compensate significantly for the decreased satisfaction with their teenage learners.

Another type of compensation by employers could be to increase the pay of teachers with a larger proportion of teenager learners. We want to check whether there is evidence in our data that employers acknowledge the increased difficulty of teaching teenagers by increasing the pay of teachers who interact mainly with this age group. The results are not presented, as the p-values for the coefficient of proportion of teenagers on teachers hourly pay in sweep 1 and 2 are respectively, 0.83 and 0.92. There is absolutely no evidence of correlation between the proportion of teenagers and the hourly wage of teachers controlling for the full range of variables introduced previously in Table 3. It does not appear that employers recognise

Table 5: Regressions of teenage learners proportion on teachers satisfaction with other aspect of the job

| | Job security | Time on admin | Salary and benefits | Training and devlpt. | Balance work/life |
|--------------------------------|-------------------|--------------------|---------------------|----------------------|-------------------|
| Proportion of teenage learners | -0.001 (0.004) | 0.010** (0.004) | 0.002 (0.004) | -0.002 (0.004) | 0.002 (0.004) |
| N | 1027 | 1027 | 1027 | 1027 | 1027 |
| Adjusted R^2 | 0.169 | 0.021 | 0.019 | 0.030 | 0.053 |

| | Support/help from managt. | resources /facilities | Career prospects |
|--------------------------------|---------------------------|-----------------------|------------------|
| Proportion of teenage learners | 0.003 (0.005) | 0.002 (0.004) | 0.001 (0.004) |
| N | 1027 | 1027 | 1027 |
| Adjusted R^2 | 0.007 | 0.009 | 0.015 |

Note: All regressions include the same control variables as described for the second column of table 3.

the increased challenge faced by teachers with large proportions of teenage learners through a pay increase for this group of teachers.

5. Conclusion

We unambiguously find that basic skills teachers, who predominantly teach teenage learners, experience greater dissatisfaction with their job and that the difference is mostly accounted for by aspects of the job related to their learners. The range of this effect is very consistent across different specifications and allowing for a large number of potential confounders. Using two sweeps of our data set, we also introduced panel data analysis. By introducing a first differences (FD) estimation, we were able to remove the potentially confounding effect of time constant heterogeneity. To summarise our results, our estimates fall in the range of -0.013 to -0.023. Taking the middle of the range as reference, the interpretation is that an increase of ten percentage points of the proportion of teenage learners decreases the satisfaction of teachers by 0.18 on a scale of 0 to 12, with a mean of 9.3 (and a standard-deviation of 1.9). To take an example, this study predicts that the 7 per cent of teachers facing exclusively teenage learners express a satisfaction level 1.8 points lower than the 25 per cent of teachers working with classes containing no teenage learners. This amounts to around 100% of a standard deviation in teachers' satisfaction with their learners.

We further checked whether there was any evidence that teachers are compensated when facing a larger proportion of teenage learners. We can unambiguously reject the assumption that better pay was offered to teachers facing extra numbers of teenagers. There was evidence that teachers with a larger proportion of teenage learners experienced less dissatisfaction with the amount of time spent on administration. However, the dissatisfaction with the amount of time spent on administration is so high for all teachers, that it is unlikely that the small decreased dissatisfaction found for this group of teachers, will compensate the dissatisfaction accrued as a result of a larger proportion of teenage learners.

Thus, both intrinsic and extrinsic motivational factors associated with job satisfaction are negatively associated with larger numbers of teenage learners. If the paper were to inform policy makers, it would suggest that teachers' turnover may be adversely affected by the increasing proportion of teenage learners. Also the implications of our findings may be underestimated as the proportion of teenage learners age 14 to 19 (and not just 16 to 19) in the Basic Skills sector in England has increased since the collection of the data sets. One problem associated with our conclusions is that we do not have good measures of teachers' quitting behaviours and how our measures of job satisfaction might correlate. Our conclusion and recommendations have, therefore, to be taken with care until further work directly addressing this link is undertaken.

References

- Angrist, J. & Krueger, A. (1999). Empirical strategies in labor economics. In O. Ashenfelter & D. Card (Eds.) *Handbook of Labor Economics*, Vol. 3A. Amsterdam: Elsevier.
- Appleby, Y & Bathmaker, A.M. (2006). The new skills agenda: increased lifelong learning or new sites of inequality?. *British Educational Research Journal*, 32 (5), 703-717.
- Bathmaker, A. M. (2005). *Achieving the Skills for Life adult basic skills targets in England*. Paper presented at the British Educational Research Association Conference, University of Glamorgan, 15-17 September.
- Billingsley, B. S. (1993). Teacher retention and attrition in special and general education: A critical review of the literature. *Journal of Special Education*, 27, 137-174.
- Billingsley, B. S. (2004). Special education teacher retention and attrition: A critical analysis of the research literature. *The Journal of Special Education*, 38 (1), 39-55.
- Brewer, D. J. (1996). Career paths and quit decisions: evidence from teaching. *Journal of Labor Economics*, 14 (2), 313-339.
- Comings, J. & Zachry, E. (2006). *How do you teach content in adult education?*. NCSALL Occasional Paper, Harvard Graduate School of Education.
- Clotfelter, C., Ladd, H., & Vigdor, J. (2006). Teacher-student matching and the assessment of teacher effectiveness. *Journal of Human Resources*, 41(4), 778-820.
- Chevalier, A. & Dolton, P. (2005). The labour market for teachers. In S. Machin & A. Vignoles (Eds.) *What's the Worth of Education*. NJ: Princeton University Press.
- DFES. (2000). *National standards for adult literacy and numeracy*. Reference number NSALN.
- DFES. (2001). *Skills for Life: The national strategy for improving adult literacy and numeracy skills*. Reference number SFLLN, Executive summary version. Retrieved August, 13, 2007 from <http://www.dfes.gov.uk/readwriteplus/publications>.
- DFES. (2003). *Skills for Life teaching and qualifications framework: A user's guide*. Reference number SFLTQG.

- DFES. (2003). *Skills for Life, the national strategy for improving adult literacy and numeracy skills: Focus on delivery to 2007*. Reference number SFLNS2.
- Figlio, D. N. (1997). Teacher salaries and teacher quality. *Economics Letters*, 55 (2), 267-271.
- Freeman, R. (1984). Longitudinal analysis of the effects of trade unions. *Journal of Labor Economics*, 2, 1-26.
- Griliches, Z. & Hausman, J. (1986). Errors in variables in panel data. *Journal of Econometrics*, 31 (1), 93-118.
- Goodlad, J. (1984). *A place called school*. New York: McGraw-Hill.
- Hanushek, E.A., Kain, J.F. & Rivkin, S.G. (2005). Teachers, schools, and academic achievement. *Econometrica*, 73 (2), 417-458.
- Harell, P., Leavell, A., Van Tassll, F., & McKee, K. (2004). No teacher left behind: A five year study of teacher attrition. *Action in Teacher Education*, 26(2), 46-59.
- Imazeki, J. (2005). Teacher salaries and teacher attrition. *Economics of Education Review*, 24 (4), 431-449.
- Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Education Research Journal*, 38(3), 499-534.
- Johnson, S. M. (2004). *Finders and keepers: Helping new teachers survive and thrive in our schools*. San Francisco: Jossey-Bass.
- Knight, C. C. & Sutton, R. E. (2004). Neo-Piagetian theory and research: enhancing pedagogical practice for educators of adults. *London Review of Education*, 2 (1), 47-60.
- Latham, N. I. & Vogt, W. P. (2007). Do professional development schools reduce teacher attrition?: Evidence from a longitudinal study of 1,000 graduates. *Journal of Teacher Education*, 58 (2), 153-167.
- Liu, E., Kardos, S., Kauffman, D., Peske, H. & Johnson, S. M. (2000). *Barely breaking even: Incentives, rewards, and the high costs of choosing to teach*. Retrieved April 24, 2007 from <http://www.gse.harvard.edu/ngt/Barely%20Breaking%20Even%200700.PDF>.
- LLUK. (2007). *Skills for Life workforce data collection and analysis*. Retrieved August 13, 2007 from http://www.talent.ac.uk/news_details.asp?NewsID=1103.
- Lortie, D. (1975). *Schoolteacher*. Chicago: University of Chicago Press.
- Murnane, R., Singer, J. D., Willet, J. B., Kemple, J. J., Olsen, R. J. (1991). *Who will teach? Policies that matter*. Cambridge, MA: Harvard University Press.
- Mont, D. & Rees, D. (1996). The influence of classroom characteristics on high school teacher turnover. *Economic Inquiry*, 34 (1), 152-167.
- NAO (National Audit Office). (2004). *Skills for Life: Improving adult literacy and numeracy*. Retrieved November 7, 2007 from http://www.nao.org.uk/publications/nao_reports/04-05/040520.pdf.
- NAO (National Audit Office). (2008). *Skills for Life: Progress in improving adult literacy and numeracy*. Retrieved November 7, 2007 from http://www.nao.org.uk/publications/nao_reports/07-08/0708482.pdf.
- NRDC. (2006). *First report on the teachers study*. Working Paper of the National Research and Development Centre for Adult Numeracy and Literacy, Institute of Education, University of London.
- Smith, C. & Hofer, J. (2002). Pathways to change: A summary of findings from NCSALL's staff development study. *Focus on Basics*, 5 (D), 1-7.
- Stinebrickner, T. R. (1998). An empirical investigation of teacher attrition. *Economics of Education Review*, 17 (2), 127-136.
- Stockard, J. & Lehman, M. B. (2004). Influences of the satisfaction and retention of 1st year teachers: The importance of effective school management. *Educational Administration Quarterly*, 40 (5), 742-771.
- Voke, H. (2002). Understanding and responding to the teacher shortage. *Association for Supervision and Curriculum Development Infobrief*, 29, 1-17.
- Walker, J., Vignoles, A., & Collins, M. (2007). *Higher education academic salaries in the UK*. London School of Economics, Centre for Economics of Education Discussion Paper No. 75.
- White, P., Gorard, S. & Huat See, B. (2006). What are the problems with teacher supply?. *Teaching and Teacher Education*, 22 (3), 315-326.

Appendix A

The National Qualifications Framework (for more information go to the QCA website at www.qca.org.uk)

| Revised NQF from September 2004 | Level of qualification | General | Vocationally related | Occupational |
|---------------------------------|------------------------------------|-----------------------------|---------------------------|--------------|
| 7 | 5 | higher level qualifications | | |
| 6 | 4 | | | |
| 5 | | | | level 5 NVQ |
| 4 | | | | level 4 NVQ |
| 3 | 3 advanced | A-levels and AVCE | Vocational qualifications | level 3 NVQ |
| 2 | 2 intermediate | GCSE grade A* - C | | level 2 NVQ |
| 1 | 1 foundation | GCSE grade D - G | | level 1 NVQ |
| Entry | Entry levels E1 to E3 | | | |
| Pre-Entry | Pre-Entry levels milestones 1 to 8 | | | |

Appendix B

Judging by your experience in the last three months, how satisfied or dissatisfied are you personally with each of these aspects of a teacher's job?

| | Very satisfied | Mainly satisfied | Neither satisfied nor dissatisfied | Mainly dissatisfied | Very dissatisfied |
|--|----------------|------------------|------------------------------------|---------------------|-------------------|
| 1. Learner behaviour | | | | | |
| 2. Job security | | | | | |
| 3. Learner progress and achievement | | | | | |
| 4. Proportion of time on administration | | | | | |
| 5. Salary and related benefits | | | | | |
| 6. Training and development opportunities | | | | | |
| 7. Balance between work and personal life | | | | | |
| 8. Support and help received from managers | | | | | |
| 9. Appreciation of your work by learners | | | | | |
| 10. Availability of resources and facilities | | | | | |
| 11. Prospects for career advance | | | | | |

Appendix C

Regressions of teachers satisfaction on proportion of teenage learners, all estimated coefficients for table 3 in the main text.

| | | | |
|--|----------------------|----------------------|----------------------|
| Proportion of teenage learners | -0.020*** (0.002) | -0.023*** (0.007) | -0.022** (0.010) |
| Male | -0.486*** (0.155) | -0.480*** (0.157) | -0.533*** (0.199) |
| Age | 0.010 (0.006) | 0.010 (0.006) | 0.012 (0.008) |
| Highest qualification is level 4 | -0.130 (0.233) | -0.129 (0.233) | -0.285 (0.335) |
| Highest qualification is more than level 4 | -0.143 (0.250) | -0.139 (0.250) | -0.347 (0.352) |
| Full-time | -0.649** (0.273) | -0.648** (0.276) | -0.650* (0.381) |
| Fractional | -0.872*** (0.291) | -0.872*** (0.293) | -0.948*** (0.413) |
| Hourly paid | -0.879*** (0.320) | -0.885*** (0.323) | -0.936*** (0.449) |
| Numeracy | -0.036 (0.182) | -0.036 (0.182) | 0.145 (0.229) |
| Literacy | 0.149 (0.173) | 0.145 (0.173) | 0.288 (0.218) |
| Temporary contract | 0.025 (0.148) | 0.030 (0.148) | -0.121 (0.198) |
| White British and European | 0.014 (0.265) | 0.011 (0.266) | -0.029 (0.321) |
| Proportion of impaired learners | 0.105 (0.161) | 0.116 (0.164) | 0.191 (0.210) |
| East Midlands | 0.240 (0.224) | 0.253 (0.226) | 5.046*** (0.869) |
| East of England | 0.125 (0.205) | 0.132 (0.206) | 3.667*** (0.996) |
| North East | -0.089 (0.205) | -0.076 (0.206) | 1.172* (0.632) |
| North West | -0.165 (0.196) | -0.158 (0.196) | 1.915*** (0.695) |
| South East | -0.292 (0.196) | -0.283 (0.197) | 3.063*** (0.999) |
| | (0.376) | (0.375) | (0.624) |

| | | | |
|---|---------------------|---------------------|----------------------|
| South West | 0.059 (0.285) | 0.068 (0.284) | -0.555 (0.560) |
| West Midlands | 0.357 (0.219) | 0.363* (0.218) | 2.174*** (0.624) |
| Yorkshire and Humbersid | -0.331 (0.237) | -0.324 (0.239) | -0.783 (0.539) |
| Missing region | 1.096*** | 1.093*** | -0.043 |
| FE College | 0.330* (0.184) | 0.338* (0.186) | -3.501*** (0.697) |
| Adult Community learning | 0.694*** (0.206) | 0.687*** (0.206) | -2.922*** (0.802) |
| Proportion of teenage learners squared/100 | | 0.001 (0.001) | 0.001 (0.001) |
| Organisation dummies | | | yes |
| N | 1027 | 1027 | 1026 |
| R ² | 0.207 | 0.208 | 0.469 |
| Adjusted R ² | 0.188 | 0.188 | 0.229 |

Note: Figures in parenthesis are robust standard-errors.

Appendix D

Proportion of teenage learners taught by quartile

| | 1st quartile (no teenage learners) | 2nd quartile (1%<prop<10%) | 3rd quartile (11%<prop<75%) | 4th quartile (prop>75%) |
|---|--|-------------------------------|--------------------------------|----------------------------|
| Sweep 1 (1027 teachers) | | | | |
| Average proportion of teenage learners | 0 | 5.3 | 42.7 | 92.8 |
| Number of teachers | 295 | 265 | 228 | 239 |
| Sweep 2 (661 teachers) | | | | |
| Average proportion of teenage learners | 0 | 5.4 | 42.5 | 91.7 |
| Number of teachers | 172 | 194 | 150 | 151 |