General sentiment amongst teachers and non-teachers is that teachers are underpaid. While this may certainly be true at the upper end of the skills distribution, taking account of mean student performance and mean teacher pay suggests that given the level of productivity amongst teachers (proxied by student performance), it is unclear whether teacher performance warrants higher levels of remuneration. A fundamental problem underlying the low levels of performance amongst teachers is the fact that teacher wages barely differentiate between well and poorly performing teachers – the result largely of the fact that very few (if any) measures of teacher quality exist (Taylor, Spaull, Gustafsson & Armstrong, 2011: 4).

Internationally, teachers are thought to be underpaid. In a South African context, however, it is difficult to argue that they should earn more. Between 2007 and 2009, teacher received an increase in real wages of 15% percent, despite the financial crisis. The question to be answered is therefore not necessarily whether South African teachers should be paid more, but rather how teacher remuneration should be structured in order to ensure the high quality education. What is required is a pay system designed to incentivise good teaching as well as linking salary increments to experience in a way that discourages good teachers from leaving the profession. Indeed, top-performing teachers are often attracted out of the teaching profession and into private sector jobs with far more attractive wages (Taylor et al., 2011:6).

In South Africa, approximately 3% of the economically active population are teachers in the public system. Including all individuals who classify themselves as teachers, this proportion reaches 4.5%. The teacher wage bill accounts for approximately 3.5% of GDP. Personnel spending comprises more than 80% of education spending, which in turn comprises a substantial portion of government expenditure – 20% in 2014/15. The issue of teacher pay is therefore significant from a budgetary perspective.

Teachers in the South African education system are essential. This paper presents evidence on incentives faced by teachers in the South African education system. It discusses a comparison between the wages of teachers and those of their non-teaching counterparts in the South African labour force in an attempt to paint the picture of the wage prospects associated with the profession. This is followed by a brief discussion of the grade 12 performance of students enrolled in different faculties at the University of Stellenbosch in order to investigate differences in ability (it is acknowledged that grade 12 performance is a noisy predictor of ability) amongst student indicating an intention to become teachers and those enrolled in other faculties. Next, the prospect for the introduction of explicit (pay-for-performance) incentives in the South African teaching profession is investigated. Finally, the significance of various teacher characteristics in explaining student performance is discussed in an attempt to understand which teachers are likely to be most effective in improving student performance.
Hernani-Limarino (2005: 65) points out that one of the most important determinants in the recruitment, performance and retention of high quality teachers is whether they are well-paid. This is so in the sense that the opportunity cost of becoming a teacher is determined to a large extent by the wage that individuals would earn in professions other than teaching. There are without doubt multiple factors determining the opportunity cost of teaching, including amongst other things hours worked, flexibility of schedules and job stability to name a few. However, these aspects are not captured by survey data and assigning value to these characteristics complicates the analysis. Teacher wages form the basis on which the attractiveness of the teaching profession (and therefore the likelihood that well-performing and high-ability individuals will enter the profession) is analysed.

Wage data from Stats SA’s Labour Force Survey (LFS) and Quarterly Labour Force Survey (QLFS) are used for 2000 to 2007, and for 2010, respectively. The biannual LFS was replace by the QLFS in 2008, but Stats SA did not release earnings data for the first two years in which the QLFS was conducted. The analysis only includes employed workers with at least 12 years of education.

The most prominent findings regarding teacher wages are outlined below.

1. The distribution of teacher wages relative to those of non-teaching professionals is relatively narrow. The need to differentiate between teachers performing well and those underperforming is unlikely met with such a narrow distribution.

2. Controlling for various characteristics of workers, the returns to education for teachers are markedly lower than they are for non-teachers. This indicates that for individuals with high levels of educational attainment, the teaching profession is not an attractive option from the perspective of remuneration.

3. The “age-wage” profile of teachers is relatively flat in comparison to that of non-teaching professionals and all employed non-teachers, suggesting that the wage return to remaining in the teaching profession is small relative to what is observed in non-teaching professions. However, in 2010 the age-wage profile of teachers seems to improve significantly. The profile for teachers

4. Lemieux decompositions of the distribution of teacher wages suggest that were teachers remunerated according to the same structure as all non-teacher workers (i.e. if education and experience amongst teachers were remunerated for teachers in the same way that they are remunerated amongst non-teachers), the distribution of teacher wages would lie to the left of what is actually observed for teachers. This implies that relative to all non-teacher workers in the South African labour market, teacher are relatively well-paid. However, when the decomposition is performed comparing teachers to non-teaching professionals, the distribution of teachers lies to right of that observed for teachers, indicating that relative to non-teaching professionals teachers the remuneration received by teachers is somewhat lower.

The wages of teachers therefore do not appear to attract

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1. Gender, marital status, union membership, race, province, year and industry.
highly educated individuals to the teaching profession. The age-wage profile of teachers was somewhat unattractive in the early 2000s, but this seems to have improved in 2010.

What does this salary structure mean for who joins the teaching force? Using data from the University of Stellenbosch, a comparison between the performance of students enrolled for a Bachelor of Education (BEd) degree and the performance of student enrolled in other faculties is made. The comparison of grade 12 mathematics and language performance of students across faculties reveals that students enrolled in the education faculty are outperformed by students in all faculties except humanities.

This suggests a lower level of ability amongst students who intend becoming teachers. Importantly, it is not true to say that lower returns to education and an apparently unattractive age-wage profile is the reason that low-performing individuals join the teaching profession. It is important, however, to consider the attractiveness of teaching relative to other professions likely to attract highly able individuals.

2 Teacher incentives in South Africa: A theoretical investigation

This section analyses theoretical models of teacher incentives in education, focussing predominantly on two models of incentives and highlighting characteristics and circumstances that must exist in order for incentives to be effective. The incentive models of Holstrom and Milgrom (1991) and Kandel and Lazear (1992) discuss elements that may characterise an incentive scheme in the context of the education system.

The multitasking model (Holstrom and Milgrom, 1991) demonstrates possible inefficiencies that result from incentivising performance based on some performance measure. In the instance that the introduction of a performance measure induces teacher to behave in a way that improves the performance measure at the expense of improving genuine human capital development amongst students (e.g. teaching to the test as opposed to ensuring full curriculum coverage). However, in the case that multitasking behaviour doesn’t actually detract from human capital development amongst students, or in the case where very little learning is actually taking place then behaviour such as “teaching to the test” is likely an improvement relative to what would have happened in the absence of the incentive measure. In the case of teaching to the test, at least some learning is taking place. This may be relevant in the case of South Africa.

The model of peer pressure as an incentivising force depends on teachers being rewarded as a group and not on an individual basis. Peer pressure is useful in the creation of incentives only in the instance that workers (teachers) are able to observe the “genuine” product of each other’s work (i.e. they are able to observe the teaching practice of other teachers and not a performance measure) and that they are able to “punish” colleagues who do not behave in a desirable way.

Problematic in the case of gaming behaviour is the fact that measured performance improves but very little human capital development takes place. This implies that in the absence of the incentive the “observed” improvements in student performance fall away.
2.1 International evidence on teacher incentives

Incentives schemes for teachers are widely used internationally. In most cases, improvements in student test performance are observed with the introduction of teacher incentives, but the persistence of these incentives is unclear. In the only case in which student performance has been monitored after the termination of incentives programme (in Kenya), student performance has returned to levels observed before the introduction of performance incentives.

In some international incentive schemes, incentives are awarded on a school-by-school basis. Schools with the highest level of student performance (in the case of Chile) or schools reaching prescribed performance improvement targets (in the case of the state of Pernambuco, Brazil). A very useful feature of both of these systems is that schools compete with other schools within their socioeconomic group. In a highly unequal education system like South Africa, this is an attractive feature as it is widely known that educational performance is driven by many factors, a large proportion of which are related to the socioeconomic status of the school. This feature may therefore prove useful is ensuring a “fair” degree of competition amongst schools.

North Carolina’s ABC accountability framework take the approach of labelling poor performing schools as such, which has the effect of discouraging teachers from teaching at those schools.

An interesting case in the field of teacher incentives is that of Finland, specifically for the lack of explicit incentives in place for teachers. A key driver of teacher quality in Finland is the prestige associated with the teaching profession. The high level of quality that characterises teaching in Finland is associated with the highly competitive entry requirements for teacher training, with the result that those accepted and trained as teachers enjoy a high degree of autonomy and trust amongst the Finnish population. Perhaps the most interesting feature of the teaching profession in Finland is the modesty of teacher wages relative to per capita GDP.

2.2 Incentives inherent in the South African teaching profession

As discussed above, implicit incentives in the teaching profession (i.e. those associated with the salary structure) appear to encourage weak performers to enter the profession. This is largely thought to be driven by the “career-less” nature of teaching in South Africa. The remuneration structure characterising South Africa’s teaching profession is what Lortie refers to as “front-loaded” (Lortie, 1975). Very little progression from teachers’ initial salary notch occurs over time with the result that the difference in earnings and status of beginner teachers and those with some experience do not differ significantly.

A possibility for the creation of incentives amongst teachers is through the professionalization of teaching. By controlling access and membership, demanding a certain level of mastery of a distinctive body of knowledge and committing to the well-being of clients, individuals are deemed experts in their field.
Teaching in South Africa does not appear to fulfil the characteristics of a profession. Simkins (2010: 11) points out that some 45% of new teachers registered with the South African Council of Educators (SACE) in 2009/10 were registered as provisional registrations as a result of the fact that they did not have the required qualifications for full registration. This stands in stark contrast to the high level requirements of expertise characterising professionals. Indeed, Lortie (1975) observes that “one of the striking features of teaching is the abruptness with which full responsibility is assumed”, in comparison with the extensive period of time required of other professions in a residency or “internship” role. This observation is applicable internationally, not just in South Africa. It appears that teaching is ill-suited for professionalisation.

Teacher performance is currently monitored by the Integrated Quality Management Systems (IQMS). The IQMS includes evaluation through self-assessment and through a development support group (DSG), which includes the teacher’s immediate senior and a peer in their field of specialisation. Teachers are allowed to choose which of their peers is to be part of the DSG. The process of evaluation is intended to develop and nurture teachers in their role. Evaluation in no way enables teacher to exert pressure on their peers nor engage in any type of disciplinary action against them. Allowing teachers to choose which colleagues will join the DSG implies that teachers have an indirect say in their evaluation as it is possible that teachers will choose peers most likely to provide a good assessment. It is unlikely then that peer pressure will prove useful as an incentivising force.

Teacher incentives rely on measures of student performance on standardised tests. The fact that student performance is determined by a myriad of factors outside the control of teachers renders it grossly unfair to rank and reward teachers on the basis of measures that are largely outside of their control. South Africa’s history of inequality, particularly in the case of the education system, means that the quality of education received by teachers from different race groups differs dramatically. It is unfair to judge teachers on the basis of student performance alone.

Having investigated teacher pay and incentives in South Africa in an attempt to understand what type of incentives exist for individuals to join the teaching profession, it is sensible to try and understand which individuals are likely to have the most significant impact on student performance. The relationship between teacher characteristics and student performance is elusive. Conflicting or indeterminate results occur often in the education literature.

Despite the variety of conflicting results in the literature, Hanushek (2009: 171) states that there is little doubt that high quality teaching is the key element in the improvement of student performance. His estimates of the impact of teachers on student performance both when they are in school and in the early years of their careers are significant, with students being taught by high-performing teachers (1 standard deviation above the mean, or at the 84th percentile of the distribution) perform on average 0.2 standard deviations above their peers at the end of the year, and that the long-term impact of high-performing teachers is 70% of the immediate gain (Hanushek, 2011: 42).

In order to understand whether or not teacher characteristics (both demographic and human capital or productive characteristics) impact on student performance, this work makes use of data from the Southern and
Eastern African Consortium for Monitoring Educational Quality (SACMEQ) study conducted in 2007 (SACMEQ III). SACMEQ III is administered to grade 6 students across 15 countries, with students writing an English, mathematics and health test. Teachers were also requested to take a test in the subject in which they taught as well the health test. SACMEQ III is particularly useful in the context of South Africa because this is first (and so far only) record of teacher performance. It is therefore possible to measure the impact of teacher knowledge on student performance.

The analysis is conducted using hierarchical linear modelling (HLM). HLM allows us to control for variation at the level of individual students and at the level of the classroom (or teacher). This allows for a more accurate calculation of standard errors. The analysis finds a statistically significant impact on student performance for the following teacher characteristics:

- Teacher maths score;
- 6 to 10 years of teaching experience;
- 31 to 35 years of teaching experience;
- Completed university degree.

All of these characteristics are positively associated with student performance. The most interesting finding, however, is that students taught by younger teachers appear to perform better. It is also found that younger teachers perform better on teacher tests in both mathematics and language. The fact that we control test performance by teachers means that the result is not driven by superior content knowledge of younger teachers as this is controlled for in the regression. This result seems to suggest that younger teachers are better teachers than older teachers. Amongst countries who participated in SACMEQ, this seems to be a finding unique to South Africa. The identical model was run for a number of African countries. The result also appears to be unique to this cohort of teachers. The model is run using SACMEQ II to test whether similar age effects are observed in earlier years. South African teachers didn’t take the teacher test in earlier years so it was not possible to control for teacher content knowledge and test performance. The strong positive and significant effect observed for the 2007 sample is not observed in the earlier sample.

So what could explain the differences in the performance of students taught by younger teachers and the performance of younger teachers on the teacher test? A possible explanation is the change that took place in teacher training during the late 1990s and early 2000s. Until 2001, teacher training was conducted in teacher training colleges. In 1999, teacher training colleges were given the option of remaining open (if they could enrol 2000 students) or being incorporated into universities and universities of technology (Chisholm, 2009: 17).

They were officially integrated in 2001, and teacher trained after the incorporation would have been 25 years old in 2007 (when SACMEQ III was conducted). This may explain differences in both the academic performance and pedagogical skills of teachers in the youngest cohort.

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