
Different rules for different teachers: teachers' views of professionalism and accountability in a bifurcated education system¹

Nimi Hoffman, Yusuf Sayed and Azeem
Badroodien

Abstract

This paper reports the initial results from a representative survey of teachers in the Western Cape regarding their views of professionalism and accountability. This is the first survey of its kind in South Africa. Preliminary analysis of the data from 115 public schools suggests that teachers at no-fee schools, who are predominantly black women, report facing the greatest institutional burdens and the greatest need for institutional support, particularly from the state. Related to this, they tend to stress pastoral care-work as central to being a professional, while those at fee-paying schools stress their claims to pedagogical knowledge and job prestige. This indicates that teachers at different schools are subject to different and unequal institutions (or rules), where the kind of school that teachers work at often reflects their race and gender positioning. It also implies that the concept of a bifurcated education system, characterised by different production functions and outcomes for learners, should be expanded to include teachers and deepened to include institutions.²

¹ The financial assistance of the National Research Foundation (NRF) for the South African Research Chair in Teacher Education towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at, are those of the authors and are not necessarily to be attributed to the NRF or its partners.

² The authors would like to thank the Western Cape Education Department, the Department of Basic Education, the South African Council for Educators, the South African Democratic Teachers' Union, and the National Professional Teachers' Organisation of South Africa, as well as other stakeholders for their invaluable support for the project. The authors would also like to thank all members of the Centre for International Teacher Education for providing a consistently supportive and intellectually rich environment to conduct the research. The special contribution of all the fieldworkers, especially Xolisa Mdleleni, is hereby acknowledged.

Introduction

This paper reports the initial results from a representative survey of teachers' understandings of their work in the Western Cape, the first of its kind in South Africa. The survey is ongoing; however, a descriptive analysis of the current data from 115 schools is instructive. In this paper, we consider teachers' understandings of professionalism and accountability. We ask: how do race, gender and class shape teachers' understandings of their work, and what does this reveal about how their schools function?

The paper proceeds as follows. We first sketch debates on professionalism and accountability, and link these debates to literature on the bifurcated education system and the role of institutions in reproducing inequality. We then set out the research problem and design. In the descriptive analysis, we consider the types of educational inequalities surveyed teachers face. We then consider the interplay between teachers' institutional positioning and their perceptions of what professionalism consists of, whom they feel they should be accountable to, and the obstacles they face in being professionals.

We find that teachers at no-fee schools, who are predominantly black women, report facing the greatest institutional burdens and the greatest need for institutional support, from both state and non-state actors. Related to this, they tend to stress pastoral care-work as being central to their conceptualisation of what it is to be a professional teacher, while those at fee-paying schools stress their claims to pedagogical knowledge and job prestige.

These results add to the literature characterising South Africa's education system as a tale of two schooling systems, one for a multi-racial elite, and the other for an impoverished black majority. The findings suggest that the concept of a bifurcated education system should be expanded beyond learners to include teachers, and that it should be deepened to include institutions that are differentiated by race, class and gender. We argue that doing so lays the groundwork for a causal analysis of how the bifurcated education system reproduces itself. This is in turn useful for identifying counter-measures for a more equitable system.

Literature overview

The professional status of teachers is a contested one. Do teachers occupy the position of the classical professions, such as doctors and lawyers, or are they closer to other kinds of groups, such as nurses or social workers? At the heart of this scholarly debate lie differing views of teachers' claims to autonomy, knowledge and service (Locke, 2004; Sexton, 2007; Gamble, 2010). The strength of teachers' claims to autonomy and knowledge is arguably related to how they are perceived and governed by the state and the public in general. The weaker the claim, the less their perceived status and esteem. The stronger the claim, the more they are seen as members of a legitimate profession.

The debate over teachers' professional status is not only scholarly but also political. A number of scholars interpret the debate as an ideological contest over different forms of educational governance (Sachs, 2001; Stevenson, Carter and Passy, 2007; Hilferty, 2008). This debate is sometimes interpreted in terms of a contest between 'democratic' and 'managerialist' views of educational governance (Sachs, 2001; Whitty, 2006; Gamble, 2010; Hargreaves and Fullan, 2013; Silova and Brehm, 2013). More 'democratic' views of educational governance are viewed as according greater value to teachers' agency and autonomy; they are understood to conceptualise educational excellence as a form of horizontal collaboration between teachers and various constituencies, including learners, parents, unions and the state, where such collaboration enables teachers' creative autonomy. In contrast, more 'managerialist' views of educational governance are viewed as placing less emphasis on the value of teachers' autonomy; instead they are understood to conceptualise educational excellence through vertical accountability to state and/or corporate actors, so that education is standardised and efficient.

Insofar as teachers' claims to professionalism are shaped by situational and institutional factors, their professional standing is fluid and may change over time (Day, Kington, Stobart and Sammons, 2006). In this regard, Hargreaves (2000) argues that there have been discrete historical phases of professionalism: the pre-professional age, the age of the autonomous professional, the age of the collegial professional, and the post-professional age. For Hargreaves (2000), teachers' claims to professionalism were at its height in the age of the autonomous professional, but have since been eroded. He argues that in the post-professional period particularly, the state has subjected schools to market principles such that they are governed under

precepts of economic efficiency and competition for students and resources. Teachers and their professional organisations are seen as obstacles to the marketisation of education. They are therefore restricted in the scope of their decision-making, coaxed into more temporary contracts and subject to “discourses of derision” that hold them responsible for the alleged ills of public or state education. The effect of all this is to return teaching to a low-status, amateur, almost pre-modern craft, where teachers have to deal with centralised curricula and testing regimes and cope with ever-increasing bureaucratic demands that erode their classroom autonomy and judgement (Hargreaves, 2000, 167–169). However, such analyses are based predominantly in Anglo-American experiences. As de Clercq (2013) argues, post-colonial societies that are riven by inequalities in teacher education and working conditions may experience all four periods simultaneously.

In post-colonial contexts, teachers’ claims to professionalism do not only rest on issues of knowledge, autonomy and service, but also centrally involve issues of unequal access to resources and conflicts over the exercise of political rights. In a number of African countries, teachers’ claims to professionalism and their relationship with the state have been characterised by prolonged struggle and contestation. In the wake of the legacy of European colonialism, African teachers have had little say in determining their conditions of service and status as professionals or workers. Thus, although teacher unions in countries such as Kenya, Nigeria, Uganda and Zambia were key actors in struggles for independence in the 1960s (Govender, 2009), they have had limited success in determining conditions of service and impacting broader policy matters in subsequent decades (Kalusopa, Otoo and Shindondola-Mote, 2013). Some have argued that this lack of influence was due to constraints resulting from the emergence of autocratic governments linked to the imposition of Structural Adjustment Programmes by the IMF and the World Bank following balance of payment crises during the 1980s (Carnoy, 1995; Chisholm, 1999 and Kalusopa *et al.*, 2013). Recently, a number of states have experimented with several market-based interventions. These include introducing low-cost private schools that use untrained community members to teach scripted curricula via tablets, casualising teacher employment and linking their pay to performance, as well as outsourcing the administration of public schools to for-profit companies (Hoffmann, 2016). A number of these experiments have gained significant traction by virtue of their financial and political backing by powerful actors, such as Mark Zuckerberg (the founder of Facebook), the Gates Foundation, the United Kingdom’s Department for International Development, and the

United States Agency for International Development. However, they have also been intensely contested by teacher unions and parents' associations (Bold Kimenyi, Mwabu, Ng'ang'a and Sandefur, 2013), as well as by the United Nations' Special Rapporteur for the right to education (Singh, 2016).

In South Africa, these struggles with the state over educational inequalities are brought into profound relief. Teachers' professional status and levels of accountability remain strongly shaped by race and class, reflecting colonial and apartheid histories of education (Vilardo, 1996; Kallaway, 2002; Ndlovu, 2002). For example, the apartheid education system was designed to produce compliant subjects across the entire population, using race as the primary mediator in the reproduction of social and economic inequalities (Turner, 1972; Cross, 1986; Adhikari, 1993; Vilardo, 1996; Ndlovu, 2002). In this, the state vested black teachers with substantially poorer quality training, less autonomy, lower wages, and less educational resources, relative to white teachers. These differences found expression in political contestations over teachers' proximity to the state, and by extension, debates about whom teachers should be accountable to and whether teachers should identify as professionals or as members of an oppressed black working class (Vilardo, 1996; Kihn, 2002; Govender, 2004).

In the post-1994 dispensation, the schooling system continues to reproduce inequalities along racial and class lines, despite a raft of policies introduced by the state to equalise schooling, including the rationalisation of government funding (Sayed and Kanjee, 2013).³ This is most evident in schools not being fundamentally desegregated; with previous white schools becoming home to a deracialised economic elite, and black schools continuing to mainly educate poor black learners (Chisholm, 2004; Motala, 2009; Spaull, 2013; Taylor and Taylor, 2013). This segregation is accompanied by substantial inequality: learners at black schools have literacy and numeracy scores far below the scores of learners at historically white schools in South Africa, or even at schools in other (poorer) African countries (Hungu. Makuwa, Ross, Saito, Dolata and Van Capelle, 2011). This context has given rise to strong scholarly and political debates about how teachers can be held accountable and whether unions subvert or enable professionalism and accountability in education (Kanjee and Sayed, 2013; Govender, 2015; Spaull, 2015).

³ However, this does not take into account school fees. When these are added to the funding mix, then historically white schools receive the highest per capita expenditure (Motala, 2006; 2009)

Moreover, the history of teacher professionalism in South Africa is not only raced and classed, but is also gendered. The interplay between these categories in a South African context complicates historical narratives of the rise of professions in western Europe, where a number of authors argue that professionalisation was essentially a patriarchal process in two senses: first, occupations dominated by men tend to have a more 'fully professional' social standing; and second, the process of professionalisation plays a role in the maintenance and development of patriarchal social relations (Hearn, 1982; Witz, 2013; Suddaby and Muzio, 2015). Since the majority of teachers are women, the status of teaching as a profession is inherently open to question and doubt. In a pioneering study, however, Clark (1998) argues that in South Africa narratives of gender are deeply interwoven with race and the establishment of a settler regime. Clark (1998) argues that only white women were at first allowed to become teachers, with their entry into teaching guided by notions of what counted as appropriate spheres for women to work and move in, ideas of sexual hygiene and comportment, and beliefs about what constituted suitable knowledge for a female teacher (knowledge of cooking, for instance, rather than mathematics or physics). Later on, however, black women were allowed to enter the teaching profession, with their entry into the profession regarded as an explicit attempt to reconstitute normative ideas of African femininity, by domesticating and racing black women in particular ways. Moreover, in line with their institutional positioning as legal minors, black women were subject to much stricter vertical accountability regimes than white women, their access to knowledge was far more tightly circumscribed and their remuneration was substantially lower. In this context, the relationship between gender, race and class plays a strong analytical role in understanding both normative ideals about teachers and how teachers conceptualise and experience their work.

The relationship between teachers' positionality and their beliefs is arguably central to an institutional analysis of the causal mechanisms underlying persistent education inequalities. The point of departure here is the concept of a "*bifurcated*" education system (Sayed and Soudien, 2005; Sayed 2016), in which poor black schools are systematically unable to convert resource inputs into learner outcomes relative to historically white schools in South Africa, or schools in other (poorer) African countries.

One way of understanding the different processes underlying two education sub-systems is to highlight the role of institutions, which provide the formal and informal rules that are understood and used by different communities and

that establish the ‘working do’s and dont’s’ for community members (Hess and Ostrom, 2007).⁴ In this, institutions can have formal policies such as the Amended National Norms and Standards for School Funding that have different financing mechanisms for poor and rich schools (DBE, 2006). Institutions can also have informal, tacit rules that guide the behaviour of education actors. For instance, the rules governing acceptable teacher absenteeism might differ across schools resulting in different absentee rates. These formal and informal aspects of institutions can combine to enable and constrain teachers’ behaviour in ways that create and embed social hierarchies.

Teachers’ beliefs are very likely a key mechanism by which institutions reproduce inequality. While this paper is interested in inequality between teachers, rather than inequality between individual learners, there are a number of experimental studies which demonstrate the general principle that teachers’ beliefs can help reproduce inequality, in the sense that their beliefs about unequal social status can lead to substantial achievement gaps amongst their learners (Steele and Aronson, 1995; Steele, 1997; Hoff and Pandey, 2004; Einav and Yariv, 2006). These studies trace the way in which such beliefs reflect institutions, or rules, that establish unequal treatment for different groups, and are invested with particular social meanings through narratives that attempt to legitimise them (Hoff and Stiglitz, 2010). In light of this, the relationship between teachers’ views and institutions matters in two ways. First, teachers’ views can indicate the ways in which institutions (particularly informal aspects) reflect social hierarchies; this is the first step in telling a causal story about how the bifurcated education system reproduces itself. Second, understanding how institutions create and reproduce inequality can be useful for identifying counter-measures for a more equitable education system.

Research problem

There is limited empirical evidence in South Africa, or internationally, of how teachers understand their role as professionals in the classroom and how they

⁴ The focus on institutions is broadly located within new institutionalism, where the importance of culture and symbolism is given much greater emphasis in institutional analysis than that found in ‘old institutional’ analyses of organisations and behaviours, which focus only on political and economic factors (Ostrom, 2010).

perceive this professional role in relation to their accountability to different educational actors, including the state, school management, other teachers and learners (De Clercq, 2013; Govender, Sayed and Hoffman, 2016).

Quantitative studies of schools in South Africa focus largely on learners' performance and socio-economic status, where data on teachers is collected and the focus is on their content knowledge and beliefs about their competencies (Khosa, 2010; Hungi *et al.*, 2011). Consequently, there is a need to gather systematic research on how teachers understand their role as professionals, and how race, class and gender shape their understandings and experiences of what it is to be a professional teacher.

The data analysed in this paper comes from a survey of teachers at public schools in the Western Cape. The survey was designed to elicit teachers' views on their role as professionals and how they perceive this role in relation to their accountability to different social actors, including the state, school management and learners. A guiding hypothesis was that race, class and gender are important mediators of teachers' experiences and perceptions. A second hypothesis was that institutions matter to the views and experiences of teachers, and that these institutions reflect race, class and gender inequalities.

Research design

Before undertaking the survey, we conducted a literature review, encompassing theoretical and empirical research in Anglo-American and African scholarship (including South African scholarship), with a special emphasis on debates concerning colonisation, apartheid and the role of unions in education (Govender *et al.*, 2016). Based on the literature review, we developed a questionnaire that an external panel of experts then examined. We piloted the questionnaire at three public schools and then revised it, primarily shortening the questionnaire and modifying ambiguous or confusing questions.

The survey was designed to be representative of public schools with regard to two important categories: their location in rural and urban districts, and their status as fee-paying or no-fee schools (as captured by their quintile status). The logistical constraints of the study meant that schools were not selected for representivity in other categories, such as school size and phase. 180 schools were randomly selected with 4540 teachers as potential respondents (see Figure 1). Schools were sampled to allow for a minimum response rate of 51% for

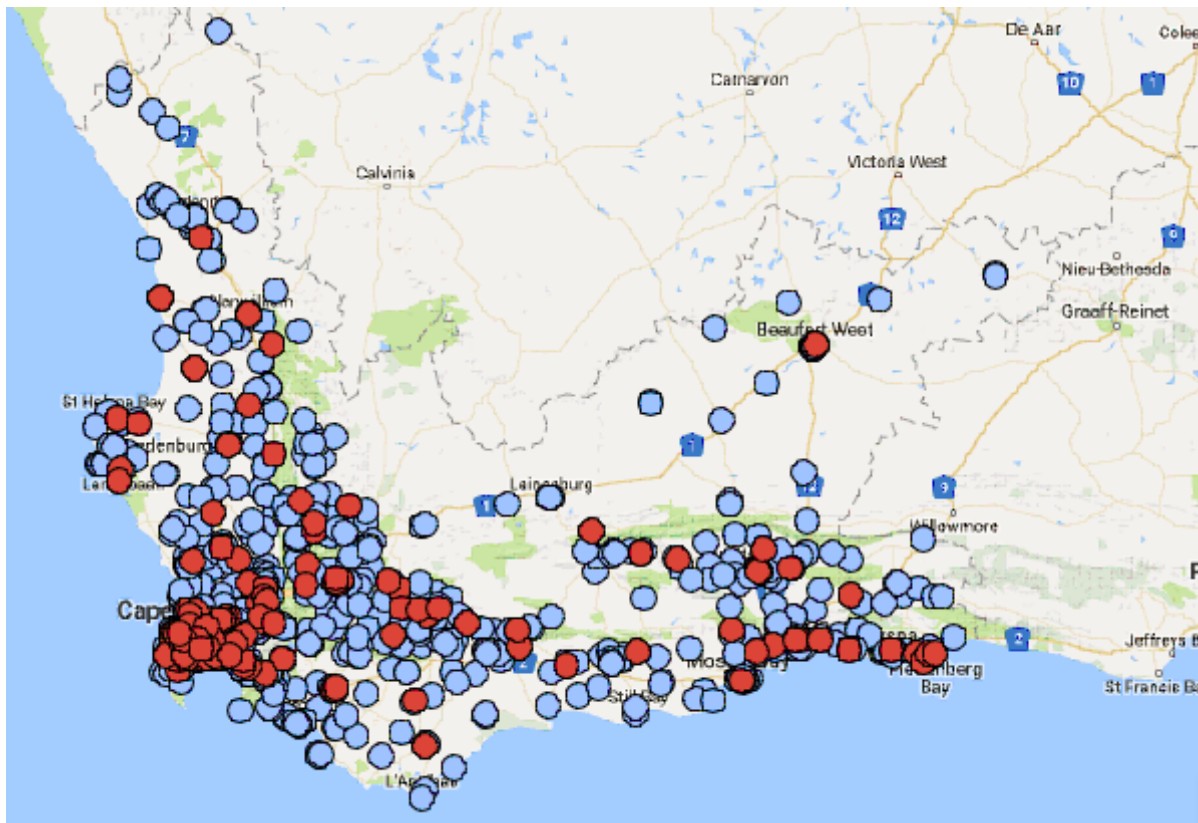


Figure 1: Distribution of surveyed schools (sampled schools in red, unsampled schools in blue)

teachers. Currently, 52% of teachers and 71% of schools have responded positively, although the survey is still ongoing.

Ethical approval for the study was obtained from the Western Cape Education District and Cape Peninsula University of Technology. All respondents gave their informed consent to participate in the study. Respondents completed a self-administered questionnaire in English or Afrikaans, according to their preference (principals at isiXhosa medium schools rejected questionnaires in isiXhosa, citing relatively higher English literacy). Fieldworkers administered the questionnaire after school. Teachers typically took thirty minutes to complete the questionnaire, but they were allowed as much time as they wished.

The anonymous questionnaire consisted of 180 questions in 8 categories: (1) demographics, (2) professionalism, (3) autonomy, (4) continuous professional development, (5) policies that affect teachers, (6) accountability, (7) teacher organisations, and (8) violence in schools. The questions were in likert scale and dichotomous (yes/no) formats. In addition, fieldworkers completed their own questionnaire concerning their observations of the school infrastructure, their interaction with the principal, and any questions teachers had regarding the questionnaire.

Drawing from the literature review, the questionnaire focused on five main characteristics of professionalism: knowledge, autonomy, service, qualifications, and political identity. We also asked questions about the main obstacles to being a professional teacher, and here we focused on the social standing of teachers (including their remuneration and community standing), constraints on autonomy, the availability of resources (including both physical infrastructure and knowledge resources), workloads and institutional support for teachers. With regard to accountability, we considered which groups teachers felt most accountable to. We included items on both vertical accountability (such as accountability to the state) and horizontal accountability (such as accountability to other teachers).

There are two important limitations to the study's design. First, since the survey was voluntary, non-response of schools or teachers is plausibly a source of sampling bias. Their reasons for declining to participate in the survey may be correlated with their views and experiences of professionalism and accountability (Heckman, 1979). Second, on the basis of the pilot data, informal interviews with teachers in the pilot study, and secondary empirical

research (Hungu *et al.*, 2011), we have reason to believe that many teachers have poor literacy skills relative to their oral skills. This implies a greater cognitive effort to complete the questionnaire, resulting in respondent fatigue and less accurate results. Ideally, the survey would have been conducted in interview form, but time and budgetary constraints did not permit this option, so the questionnaire was simplified and shortened as much as possible.

Preliminary analysis

Sample characteristics

Since the survey is not yet complete (71% of target schools had been surveyed at the time of writing), this preliminary analysis treats the data as a population, rather than as a representative sample. However, it is useful to check whether the sample proportions match those of the population. Here we report the proportions of teachers at no-fee and fee-paying public schools, as well as the racial composition of teachers.

By government policy, schools in Quintiles 1 to 3 do not charge fees, while Quintiles 4 to 5 charge fees (Department of Education, 2006). In the sample, the proportion of no-fee schools to fee-paying schools corresponds with that of the population (Table 1.1). Although the survey was not designed for the racial representivity of teachers, the composition of teachers in the sample corresponds with that of different groups in the population (Table 1.2).

Table 1.1: Fee and no-fee paying schools in the Western Cape and from survey data

School type	Western Cape data		Survey data	
	Frequency	% of cases	Frequency	% of cases
No-fee school (Quintile 1–3)	671	46%	51	44%
Fee-paying school (Quintile 4–5)	786	54%	64	56%
Total public schools	1457	100%	115	100%

Notes: WCED data is missing information for 8 schools, which are not included in this table.

Table 1.2: Race composition of teachers in the Western Cape and from survey data

Race	Western Cape data		Survey data	
	Frequency	% of cases	Frequency	% of cases
African/Black	6 888	19%	393	17%
Coloured	18 370	50%	1 164	51%
Indian/Asian	306	1%	35	2%
Other	327	1%	37	2%
White	10 568	29%	569	25%
No response	-	-	89	4%
Total	36 459	100%	2 287	100%

What kinds of educational inequalities do teachers face in terms of race, gender and class?

A breakdown of teacher characteristics by race and gender suggests that, on average, African and coloured women bear the brunt of educational inequalities, while white and Indian women indicate greater advantage relative to other women (Table 2).⁵ This provides grounds for grouping African and coloured women together under the term ‘black women’ in order to investigate the intersection of race and class in a clear and simple way. An analysis of the difference in means for black women compared to other groups provides the following statistically significant and substantive results (Table 3):

- 58% of black women work at no-fee schools compared to 33% of other teachers
- Black women teach classes that are 14% larger on average than classes of other groups

⁵ Coloured women are the least qualified and are least likely to send their children to their own school relative to all other groups. African women have the largest class sizes, work overwhelmingly at no-fee schools, and tend not to live in their school community. White women indicate greater advantages relative to all black women, save for their disproportionate status as temporary teachers. Indian women indicate similar characteristics to white women, but have a much greater presence on the school management team than all other women and a lower incidence of temporary employment than white women. Women across racial categories tend to indicate greater disadvantages relative to men, but in some instances white and Indian women indicate greater advantage than black men, as noted in Table 2 above.

- 48% of black women have a university qualification in contrast with 65% of other teachers
- 14% of black women have a school leadership role compared with 22% of other teachers
- 47% of black women send their children to their school or would do so if they had children, compared to 51% of other teachers
- 38% of black women live in their school communities while 43% of other teachers do so

Table 2: Teacher characteristics by race and gender

	Female				Total
	African	Coloured	Indian	White	
No-fee school	0.83 (0.09)	0.48 (0.07)	0 (0)	0.18 (0.06)	0.46 (0.05)
Has a university qualification	0.53 (0.04)	0.46 (0.03)	0.68 (0.13)	0.72 (0.04)	0.55 (0.02)
Lives in school community	0.36 (0.05)	0.39 (0.03)	0.41 (0.14)	0.53 (0.06)	0.42 (0.03)
Sends children to own school	0.55 (0.03)	0.43 (0.03)	0.50 (0.12)	0.59 (0.06)	0.50 (0.03)
Temporarily employed	0.24 (0.04)	0.27 (0.02)	0.24 (0.08)	0.41 (0.03)	0.29 (0.02)
On school management team	0.14 (0.02)	0.13 (0.01)	0.32 (0.09)	0.10 (0.01)	0.13 (0.01)
Class size	40.8 (0.95)	36.6 (0.61)	33.4 (1.29)	28.2 (0.93)	35.3 (0.76)

Notes: Robust standard errors corrected for clustering at school level in brackets.

	Male				Total
	African	Coloured	Indian	White	
No-fee school	0.75 (0.09)	0.47 (0.07)	0.13 (0.12)	0.10 (0.06)	0.45 (0.06)
Has a university qualification	0.60 (0.08)	0.59 (0.03)	0.88 (0.12)	0.71 (0.05)	0.61 (0.02)
Lives in school community	0.40 (0.06)	0.35 (0.03)	0.38 (0.17)	0.53 (0.07)	0.39 (0.03)
Sends children to own school	0.54 (0.06)	0.42 (0.03)	0.57 (0.19)	0.68 (0.06)	0.48 (0.03)
Temporarily employed	0.23 (0.06)	0.17 (0.02)	0.25 (0.15)	0.32 (0.06)	0.21 (0.02)
On school management team	0.30 (0.04)	0.29 (0.02)	0.38 (0.17)	0.26 (0.04)	0.29 (0.02)
Class size	41.3 (1.12)	36.8 (0.62)	40.1 (4.05)	27.5 (0.90)	35.9 (0.72)

Notes: Robust standard errors corrected for clustering at school level in brackets.

This provides grounds for grouping African and coloured women together under the term ‘black women’ in order to investigate the intersection of race and class in a clear and simple way. An analysis of the difference in *means* for black women compared to other groups provides the following statistically significant and substantive results (Table 3):

Table 3: Difference in mean characteristics for black women and other groups

	Black female	Not a black female	Difference	% Difference
No-fee school	0.58 (0.02)	0.33 (0.01)	0.24 *** (0.01)	76%
Has a university qualification	0.48 (0.02)	0.65 (0.01)	0.17 *** (0.02)	-26%
Lives in school community	0.38 (0.02)	0.43 (0.02)	0.05 ** (0.02)	-12%
Sends children to own school	0.47 (0.02)	0.51 (0.02)	0.04 ** (0.02)	-8%
Temporarily employed	0.26 (0.01)	0.28 (0.01)	0.02 (0.02)	-7%
On school management team	0.14 (0.01)	0.22 (0.01)	0.08 *** (0.02)	-36%
Class size	37.8 (0.28)	33.2 (0.29)	4.5 *** (0.41)	14%

Notes: Robust standard errors corrected for clustering at school level in brackets.
Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

These results indicate that black women tend to carry greater educational burdens (working at poorer schools and teaching larger classes) with less institutional power to affect change (less formal education and fewer leadership positions). Sending one’s children to one’s school plausibly indicates a basic endorsement of the school. On this interpretation substantially fewer black women endorse the school they work at.

Many of these disadvantages are institutional in nature and concern the kind of schools in which black women teach. 63% of teachers at no-fee schools are black women (Table 5.1), and being a black woman is strongly correlated with teaching at a no-fee school, where this correlation is statistically significant at the 0.01 level (Table 5.2). But working at a no-fee school is positively correlated with substantially larger classes, and is negatively correlated with sending one’s children to one’s school and living in the school community, where these associations are statistically significant and substantive (Table 4).

One way of interpreting these patterns is that the rules of the ‘education game’ are skewed in such a way that black women teachers tend to come out losing,

so that part of the *institutional meaning* of being a black woman teacher is multiple disadvantage. This disadvantage finds expression particularly in the close relationship between being black, female and teaching at a no-fee school.

Table 4: Correlates of working at a no-fee school

	Sends children to own school¹	Lives in school community²	Class size³
No-fee school	-0.05** (0.02)	-0.03*** (0.02)	3.35*** (0.43)

Notes: Robust standard errors corrected for clustering at school level in brackets. Significance: *** p<0.01, **p<0.05, *p<0.1. 1. Probit regression 2. Probit regression. 3. OLS regression

Table 5.1: Race and gender composition of teachers at no-fee and fee schools

	No-fee school	Fee-paying school
Black female	63%	38%
Black male	25%	19%
White female	7%	26%
White male	1%	8%
Other	4%	9%
Total	100%	100%

Table 5.2: Association between working at a no-fee school and being a black woman (probit estimation)

	No-fee school
Black female	0.24*** (0.02)

Notes: Robust standard errors corrected for clustering at school level in brackets. Significance: *** p<0.01, **p<0.05, *p<0.1

Given the substantive differences between no-fee schools and fee-paying schools, and the ways in which these differences are raced and gendered, the

next section considers teachers' views of professionalism and accountability in terms of whether they work at no-fee or fee-paying schools. This distinction is largely consistent with previous work on the bimodal distribution of schools, in which the wealthiest quartile of schools (25%) performs very differently from the remaining three quartiles (75%), where the wealthiest schools are typically fee-paying historically white schools, and the remainder are typically no-fee historically black schools (Van der Berg, 2008; Spaul, 2013; Fleisch, 2013).⁶

What are the most important characteristics of a professional teacher?

Respondents were asked to indicate what they believed to be the characteristics of a professional teacher by rating thirteen statements on a likert scale: 'strongly disagree', 'disagree', 'agree' and 'strongly agree.' Table 6 presents all the 'strongly agree' responses.⁷ The majority of teachers emphasise their identity as classical professionals, stressing excellent content knowledge, intrinsic motivation, collegiality, and an ideal social positioning similar to that of doctors and lawyers. Teaching skills and lesson preparation are emphasised by fewer teachers, while a minority stress autonomy in the classroom and in the political realm as being central to their understanding of professionalism.

However, there are substantial and statistically significant differences between teachers at no-fee schools and those at fee-paying schools. Considerably fewer teachers at no-fee schools emphasise content knowledge and teaching skills, and fewer claim an identity similar to that of doctors and lawyers. Instead, many more teachers emphasise placing learners' interests first, arriving early before school starts, and knowing all the parents of learners. In contrast, more teachers at fee-paying schools report that 'going on strike' is incompatible with being a professional.

⁶ The precise division of this bimodal or bifurcated system is under debate. Some scholars argue for a division by wealth quartiles (Spaul, 2013), while others use quintiles (Van der Berg, 2008). In this paper, we use the division into no-fee and fee-paying schools, which tracks wealth quintiles.

⁷ Given the nature of likert scales, respondents tend to gravitate towards the centre. We therefore focus on the tail-end of the distribution (those who strongly agree) as this is more illustrative of differences between groups.

Table 6: Proportion of respondents who strongly agree that professional teachers have the following characteristics

	Fees	No fees	Difference	p-value
Must have excellent subject/content knowledge	75.53	67.06	-8.47	***
Teachers are professionals, like doctors & lawyers	59.07	48.31	-10.76	***
Must be passionate about teaching	56.16	51.17	-4.99	**
Must always try and support other teachers	51.85	52.75	0.90	
Must always place learners' interests first	43.84	49.68	5.84	***
Must fight against policies that are bad for learners	42.96	39.83	-3.13	
Must always arrive early before school starts	43.4	50.53	7.13	***
Must constantly update knowledge and study further	40.05	44.49	4.44	**
Must have excellent teaching skills	40.14	35.17	-4.97	**
Teachers are professional workers, like social workers & nurses	36.62	39.41	2.79	
Must prepare lessons in advance	34.51	34.75	0.24	
Can be 'political' & professional	19.98	20.23	0.25	
Must know all parents of learners	15.76	22.14	6.38	***
Teachers are workers, like textile workers & miners	14.61	15.15	0.54	
Cannot go on strike	11.09	6.57	-4.52	***
Must have curriculum freedom	9.6	11.76	2.16	*
Does not need teaching qualifications	3.43	3.39	-0.04	

Notes: Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

These differences suggest that teachers at no-fee schools may see pastoral, care-work as more central to how they understand being professional teachers, which is an area that is under-explored in the academic literature of being professional teachers. Which is an area that is relatively less explored in the academic literature. In contrast, those at fee-paying schools tend to focus more on their claims to pedagogical knowledge and job prestige. This is more in line with the normative ideals prevalent in academic literature. One explanation for these differences may lay in the different obstacles that teachers face, which we explore in the next section.

What are the most important obstacles to being a professional teacher?

Respondents were asked to indicate what they believed to be obstacles to being a professional teacher by rating twenty statements on a likert scale: 'strongly disagree', 'disagree', 'agree' and 'strongly agree.' Table 7 presents all the 'strongly agree' responses. While there is some level of disagreement

between teachers at different schools regarding their conceptions of professionalism, the disagreement between teachers regarding their views on important obstacles to professionalism is both more intense and comprehensive.

The majority of teachers at fee-paying schools identify low salaries as the most important obstacle to being a professional; in contrast, the majority of teachers at no-fee schools emphasise socio-economic problems in the surrounding community as their chief concern. This is a statistically significant and substantive difference: 62% of teachers at no-fee schools stress socio-economic problems in the community, while only 43% of teachers at fee-paying schools do, where this difference is statistically significant at the 0.01 level.

These large and statistically significant differences persist for each item in the survey. Many more teachers at no-fee schools stress learner behaviour and home background as obstacles, and indicate less support from their community. Resource allocation, in the form of class size, lack of libraries and textbooks and poor infrastructure, features far more prominently for teachers at low-fee schools. Many more of these teachers also indicate a lack of effective institutional support from education departments, school management teams, unions and colleagues as being significant obstacles, where greater emphasis is placed on education departments and the school management team. Finally, more teachers at no-fee schools identify a lack of autonomy in the classroom as obstacles to professionalism, in the form of administrative burdens and a lack of curriculum freedom.

Table 7: Proportion of respondents who strongly agree that the following are obstacles to being a professional teacher

	Fees	No fees	Difference	p-value
There are too many socio-economic problems in the community	42.67	61.88	19.21	***
Teachers' salaries are too low	60.34	59.74	-0.6	
My classes are too large	44.88	56.96	12.08	***
I have too many administrative tasks	45.23	52.78	7.55	***
Learners' home backgrounds make it difficult to be effective	38.96	52.03	13.07	***
Learners at my school are not well-behaved	39.05	45.5	6.45	***
My school does not have a library	26.59	39.61	13.02	***
My school does not have a good library	26.68	37.79	11.11	***
Education departments do not treat teachers well	30.92	37.58	6.66	***
The school management team does not communicate well with teachers	22.88	30.41	7.53	***
The school management has a top-down leadership style	20.67	29.34	8.67	***
The buildings are broken and not well-maintained	25	28.37	3.37	***
There are not enough textbooks for my learners	21.29	28.27	6.98	***
The community does not value me as a teacher	22.26	27.73	5.47	***
The Education Department doesn't provide adequate in-service training	20.23	27.3	7.07	***
Unions do not support teachers adequately	20.23	25.91	5.68	***
Teachers do not support each other at my school	18.82	25.05	6.23	***
The school management team does not support teachers adequately	17.58	23.66	6.08	***
The school management team does not treat teachers fairly	18.99	22.7	3.71	**
I do not have freedom to teach what I think is best	13.07	22.59	9.52	***

Notes: Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

These differences suggest that teachers at no-fee schools continue to bear historical burdens arising from long-term under-investment in black schools (Motala, 2006) and state violence against black people (Kallaway, 2002). However, they also suggest that teachers at no-fee schools get less support from education departments and structures within their schools. In the language of institutional analysis, there are likely two kinds of differences related to the informal aspects of institutions. The first difference lies in the informal rules guiding the behaviour of learners and the broader community, related to a history of state violence against black people. The second difference lies in the informal rules guiding the behaviour of support

structures from the state and within the school. Consequently, while a policy analysis may reveal that schools are subject to roughly equitable formal institutions, the survey data suggests that there are substantial differences in the informal dimensions of institutions.

These differences in institutional environments matter, since they may play a role in shaping how teachers conceptualise their roles as professionals. It is not implausible that teachers who work with learners who are traumatised by historical violence against black communities come to conceive of professionalism as comprising a strong pastoral, care-work component. An indication of this is a simple linear regression of teachers' views of their profession on their views of obstacles related to social trauma, which indicates that this line of thought is a promising one (Table 8). Controlling for the race and gender of teachers, as well as the no-fee status of schools, there is a positive, statistically significant relationship at the 0.01 level between teachers' emphasis on obstacles related to social trauma and their predilection for emphasising a pastoral view of professionalism. Here, social trauma factors were roughly represented by teachers' views on the following obstacles to professionalism: the poor behaviour of learners, learners' home backgrounds, socio-economic problems in the community, and community disregard for teachers. A pastoral view of professionalism was roughly captured by teachers' views on how important it was to know all parents of learners, place learners' interests first, and fight against policies that are bad for learners. This does not show that the correlation is not spurious or confounded by unobserved variables, but it does suggest that further research may bear interesting results. In particular, further research could investigate the survey data on teachers' views of the frequency and intensity of different forms of violence at school.

Table 8: The correlates (linear regression estimates) of emphasising pastoral characteristics of professionalism

	(I)	(II)
Trauma	0.04** (0.02)	0.04* (0.02)
No fee school	-0.17** (0.07)	-0.13 (0.07)
Black		0.14* (0.07)
Female		0.21** (0.10)
Black female		0.15* (0.08)

Notes: Robust standard errors corrected for clustering at school level in brackets. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Which group should teachers be held most accountable to?

Respondents were asked to indicate which group teachers should be held most accountable to by selecting one out of the ten options. Table 9.1 presents the responses for all ten options. Overall, the disagreement between teachers at different schools is more muted than their differences regarding professionalism.

The majority of respondents across schools indicate that teachers should be accountable to a state actor – the Department of Basic Education (DBE), the Western Cape Education Department (WCED) or the South African Council of Educators (SACE). This greater emphasis on vertical accountability nevertheless admits of variation between groups. A much larger proportion of teachers at no-fee schools indicate that SACE and the DBE are paramount, where these differences were statistically significant at the 0.01 level. In contrast, more teachers at fee-paying schools identify the school as a whole and the school management team as being the most important for accountability, where these differences are statistically significant at the 0.01 level. Very few teachers across schools rate the school governing body as the most important body to oversee accountability.

Table 9.1: Proportion of respondents who identified the following groups as the most important for accountability

	Fees	No fees	Difference	p-value
Western Cape Education Department	26.18	25.89	-0.29	
South African Council of Educators	13.88	20.5	6.62	***
Learners	19.98	17.07	-2.91	
Department of Basic Education	9.07	14.55	5.48	***
Parents and guardians	6.01	7.9	1.89	*
School as a whole	12.3	7.22	-5.08	***
School management team	5.92	3.32	-2.6	***
Community	2.68	1.6	-1.08	
School governing body	2.78	1.49	-1.29	**
Teacher organisations	1.2	0.46	-0.74	*

Notes: Significance: *** p<0.01, **p<0.05, *p<0.1. 1.

These results are largely consistent with teachers’ responses when asked to rate the importance of all ten groups for teacher accountability on a four-level likert scale: ‘no importance’, ‘low importance’, ‘some importance’ and ‘very important.’ Table 9.2 presents all the ‘no importance’ and ‘low importance’ responses,⁸ and Table 9.3. presents all the ‘high importance’ responses. Almost a quarter of all respondents across schools indicate that the school governing body has no or low importance for accountability, and large proportions indicate that non-state actors, such as unions, communities and parents, have little or no relevance (Table 9.2). However, this contains substantive variation between schools. More teachers at no-fee schools stress the importance of various groups for accountability in general, whether to state actors or non-state actors (Table 9.3).

⁸ A very small number of respondents selected “no importance” and it was therefore more useful to group “no importance” and “low importance” responses together.

Table 9.2: Proportion of respondents who attach no/low importance to the following groups regarding accountability

	Fees	No fees	Difference	P-value
Teacher organisations	36.43	27.46	-8.97	***
Department of Basic Education	15.24	9.3	-5.94	***
South African Council of Educators	21.28	15.75	-5.53	***
Community	32.55	27.9	-4.65	**
Parents	23.17	19.69	-3.48	*
Western Cape Education Department	6.94	5.36	-1.58	
Learners	18.21	16.96	-1.25	
School as a whole	15.6	15.86	0.26	
School management team	11.81	11.71	-0.1	
School governing body	24.71	24.84	0.13	

Notes: Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9.3: Proportion of respondents who attach high importance to the following groups regarding accountability

	Fees	No fees	Difference	p-value
School management team	40.13	40.26	0.13	
School governing body	29.31	29.65	0.34	
School as a whole	39.31	39.72	0.41	
Learners	43.28	47.16	3.88	
Parents	32.91	37.86	4.95	**
Western Cape Education Department	56.27	58.21	1.94	
Community	22.27	28.88	6.61	***
South African Council of Educators	40.58	48.58	8	***
Department of Basic Education	41.3	49.45	8.15	***
Teacher organisations	17.31	26.81	9.5	***

Notes: Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Conclusion

This study makes two main contributions to the literature on basic education in South Africa. First, the results suggest that theoretical accounts of professionalism and accountability should take into account the different positionalities of teachers within the schooling system in terms of categories of exclusion and exploitation – in this case, race, class and gender.

Teachers at no-fee schools, who are predominantly black women, tend to emphasise different characteristics of professionalism relative to their colleagues at fee-paying schools. They stress the pastoral and care-work dimensions of their profession, while their colleagues at fee-paying schools stress their claims to pedagogical knowledge and job prestige as central to being a professional.

Related to this, many more teachers at no-fee schools report facing burdens related to historical under-investment in black schools, social trauma arising from state violence against black people, and a lack of institutional support from the state and the public. We suggest that it is not implausible to see a relationship between the obstacles that teachers face and how they conceptualise their roles as professionals – in this case, dealing with high levels of social trauma and conceiving of their jobs as pastoral care-work – something which future analyses of the complete survey data could investigate more carefully.

While several authors argue that the difference in accountability across schools is a key factor in explaining differences in learner performance (van der Bergh, 2007; Taylor, 2009; Spaul, 2015), the survey results indicate that teachers' different conceptions of professionalism do not necessarily suggest different views of accountability, which appear to be roughly similar across school types. Instead, the reports of teachers at no-fee schools facing the greatest burdens related to social trauma and historical under-investment in schools, suggesting they need greater institutional support, present an additional layer of potential explanations related to the ways in which teachers at different schools may be subject to different and unequal institutions. This warrants further exploration.

Second, the results suggest that inequity operates not only at the level of learners, but also at the level of teachers. The concept of a bifurcated education system should therefore be expanded to consider teachers and deepened to consider the ways in which institutions are raced, classed and gendered to create multiple disadvantages for teachers at the bottom of the social hierarchy.

References

- Adhikari, M. 1993. *Let us live for our children: the teachers' league of South Africa, 1913–1940*. University of Cape Town Press.
- Bold, T., Kimenyi, M., Mwabu, G., Ng'ang'a, A. and Sandefur, J. 2013. Scaling up what works: experimental evidence on external validity in Kenyan education. Center for Global Development Working Paper 321.
- Carnoy, M. 1995., Structural adjustment and the changing face of education. *International Labour Review*, 134(6), pp.653–673.
- Chisholm, L. 1999., The democratisation of schools and the politics of teachers' work in South Africa. *Compare*, 29(2): pp.111–126.
- Chisholm, L. 2004. Introduction. In Chisholm, L. (Ed.), *Changing class: education and social change in post-apartheid South Africa*. HSRC Press, Cape Town, pp.1–28.
- Clark, P.G. 1998. A gendered view of the history of professionalization in South Africa. *African Development*, 23: pp.77–93.
- Cross, M. 1986. A historical review of education in South Africa: towards an assessment. *Comparative Education*, 22: pp.185–200.
- Day, C., Kington, A., Stobart, G. and Sammons, P. 2006. The personal and professional selves of teachers: stable and unstable identities. *British Educational Research Journal*, 32(4): pp.601–616.
- De Clercq, F. 2013. Professionalism in South African education: the challenges of developing teacher professional knowledge, practice, identity and voice. *Journal of Education*, 57: pp.32–54.
- Department of Education, 2006. Amended national norms and standards for school funding. Pretoria: Department of Education.
- Einav, L. and Yariv, L. 2006. What's in a surname? The effects of surname initials on academic success. *Journal of Economic Perspectives*, 20(1): pp.175–188.

Fleisch, B. 2013. System reform and primary literacy. In Haslam, I.R., Khine, M.S., Saleh, I. (Eds), *large scale school reform and social capital building*. Routledge.

Gamble, J. 2010. *Teacher professionalism: a literature review*. Johannesburg. JET.

Govender, L. 2004. Teacher unions, policy struggles and educational change, 1994 to 2004. In *changing class: education and social change in post-apartheid South Africa*, pp.267–291.

Govender, L. 2009. Teachers’ participation in policy making: the case of the South African Schools Act. PhD Dissertation. University of the Witwatersrand.

Govender, L. 2015. Teacher unions’ participation in policy making: a South African case study. *Journal of Comparative International Education*, 45: pp.184–205.

Govender, L., Sayed, Y. and Hoffmann, N. 2016. Teacher professionalism and accountability in South Africa: a review of the literature (Working Paper No. WP1). Centre for International Teacher Education, Cape Peninsula University of Technology.

Hargreaves, A. 2000. “Four ages of professionalism and professional learning.” *Teachers and Teaching: Theory and Practice*, 6(2): pp.151–182.

Hargreaves, A. and Fullan, M. 2013. The power of professional capital. *JSD* 34(3): pp.36–39.

Hearn, J. 1982. Notes on patriarchy, professionalization and the semi-professions. *Sociology*, 16(2): pp.184–202.

Heckman, J.J. 1979. Sample selection bias as a specification error. *Journal of Economic Sociology*, pp.153–161.

Hess, C. and Ostrom, E. 2007. Introduction: an overview of the knowledge commons. In Hess, C. and Ostrom, E. (Eds), *understanding knowledge as a commons: from theory to practice*. Cambridge, Massachusetts: MIT press, pp.3–26.

- Hilferty, F. 2008. Teacher professionalism and cultural diversity: skills, knowledge and values for a changing Australia. *Australian Educational Research*, 35: pp.53–70.
- Hoff, K. and Pandey, P. 2004. *Belief systems and durable inequalities: an experimental investigation of Indian caste*. World Bank Publications.
- Hoff, K. and Stiglitz, J.E. 2010. Equilibrium fictions: a cognitive approach to societal rigidity (Working Paper No. 15776). National Bureau of Economic Research.
- Hoffmann, N. Forthcoming 2016. *Experimenting on people is a nasty thing. Africa's a Country*.
- Hungi, N., Makuwa, D., Ross, K., Saito, M., Dolata, S. and Van Capelle, F. 2011. SACMEQ III project results: levels and trends in school resources among SACMEQ school systems. SACMEQ, Paris.
- Kallaway, P. 2002. *The history of education under apartheid, 1948–1994: the doors of learning and culture shall be opened*. South Africa: Pearson.
- Kalusopa, T., Otoo, K.N. and Shindondola-Mote, H., 2013. *Trade union services and benefits in Africa*. Africa Labour Research Network.
- Kanje, A. and Sayed, Y. 2013. Assessment policy in post-apartheid South Africa: challenges for improving education quality and learning. *Assessment in Education: Principles, Policy & Practice*. 20: pp.442–469.
- Khosa, G. 2010. The South African national education evaluation system: what will make it work (Occasional Paper No. 1). JET Education Services.
- Kihn, P. 2002. Comrades and Professionals: Teacher Ideology and Practice in the Western Cape. In Kallaway, P. (Ed.), *The history of education under apartheid, 1948–1994: the doors of learning and culture shall be opened*. South Africa: Pearson.
- Locke, T. 2004. Reshaping classical professionalism in the aftermath of neo-liberal reform. *English in Australia*, 139: pp.113–121.

Motala, S. 2006. Education resourcing in post-apartheid South Africa: the impact of finance equity reforms in public schooling. *Perspectives in Education: Education Finance*, 24: p.79.

Motala, S. 2009. Privatising public schooling in post-apartheid South Africa—equity considerations. *Compare*, 39: pp.185–202.

Ndlovu, N.B.E., 2002. A historical-educational investigation into missionary education in South Africa with special reference to mission schools in Bushbuckridge. MEd in the History of Education. UNISA.

Ostrom, E. 2010. Institutional analysis and development: elements of the framework in historical perspective. In historical developments theoretical approaches in sociology in the encyclopedia of life support systems.(EOLSS). UNESCO.

Sachs, J. 2001. Teacher professional identity: competing discourses, competing outcomes. *Journal of Education Policy*, 16: pp.149–161.

Sayed, Y. 2016 The governance of public schooling in South Africa and the middle class: social solidarity for the public good versus class interest. *Transformation*, 91: pp.84–105.

Sayed, Y. and Kanjee, A. 2013. An overview of education policy change in post-apartheid South Africa. In Sayed, Y., Kanjee, A., Nkomo, M. (Eds), *The search for quality education in post-apartheid South Africa*. Cape Town: HSRC Press, Cape Town, pp. 5–38.

Sayed, Y. and Soudien, C., 2005. Decentralisation and the construction of inclusion education policy in South Africa. *Compare: A Journal of Comparative International Education*, 35: pp.115–125.

Sexton, M. 2007. “Evaluating teaching as a profession – implications of a research study for the work of the Teaching Council.” *Irish Educational Studies*, 26(1): pp.79–105.

Silova, I. and Brehm, W.C. 2013. The shifting boundaries of teacher professionalism: education privatization(s) in the post-socialist education space. *Educators, professionalism and politics: Global transitions, national spaces, and professional projects*. In Seddon, T., Ozga, J., Levin, J.S. (Eds).

Educators, professionalism and politics: global transitions, national spaces, and professional projects. New York: Routledge, pp.55–74.

Singh, K. 2016. UN rights expert urges Liberia not to hand public education over to a private company. United Nations Human Rights, Office of the High Commissioner.

Spaull, N. 2013. Poverty & privilege: primary school inequality in South Africa. *International Journal of Educational Development*, 33: pp.436–447.

Spaull, N. 2015. Accountability and capacity in South African education. *Education as Change*, 19: pp.113–142.

Steele, C.M. 1997. A threat in the air: how stereotypes shape intellectual identity and performance. *American Psychologist*, 52: p.613.

Steele, C.M. and Aronson, J. 1995. Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69: p.797.

Stevenson, H., Carter, B. and Passy, R. 2007. “New professionalism,” workforce remodeling and the restructuring of teachers’ work. *International Electronic Journal for Leadership in Learning*, 11: p.15.

Suddaby, R. and Muzio, D. 2015. Theoretical perspectives on the professions. *The Oxford Handbook of Professional Service Firms*, pp.25–47.

Taylor, N. 2009. Standards based accountability in South Africa. *School Effectiveness and Improvement*, 20(3): pp.341–356.

Taylor, N. and Taylor, S. 2013. Teacher knowledge and professional habitus. Unpublished.

Turner, R. 1972. *The eye of the needle: toward participatory democracy in South Africa.* Raven Press.

Van der Berg, S. 2007. Apartheid’s enduring legacies: inequalities in education. *Journal of African Economics*, 16(5): pp.849–880.

Van der Berg, S. 2008. How effective are poor schools? Poverty and educational outcomes in South Africa. *Studies in Educational Evaluation*, 34: pp.145–154.

Vilardo, P.J. 1996. *The many faces of the middle class: African teachers' politics in South Africa, 1940–1990*.

Whitty, G. 2006. Teacher professionalism in a new era. Gen. Teach. General Teaching Council for Northern Ireland Annual Lecture, Belfast, March.

Witz, A. 2013. *Professions and patriarchy*. Routledge.

Nimi Hoffman
Centre for International Teacher Education (CITE)
Cape Peninsula University of Technology
Doctoral student: Institute for Social and Economic Research
Rhodes University.

nimi.hoffman@gmail.com

Yusuf Sayed
Centre for International Teacher Education (CITE)
Cape Peninsula University of Technology
Centre for International Education, University of Sussex, UK

y.sayed@sussex.ac.uk

[sayedy@cput.ac.za](mailto:sayed@cput.ac.za)

Azeem Badroodien
Centre for International Teacher Education (CITE)
Cape Peninsula University of Technology

badroodiena@cput.ac.za