



Reproducing Inequality in the South African Schooling System: What Are the Opportunities?

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Abstract

The South African Ministry of Education has made significant progress in reducing inequality between schools; however, such inequality persists. Students from wealthier households that are able to meet their financial obligations attend well-resourced schools that are characterised by high-quality education. This chapter critically examines issues of equality in education within the framework of social justice, using theories of Sen and Bourdieu. Trends in International Mathematics and Science Study (TIMSS) 2015 Grade 9 data were used (HSRC, 2015) with particular attention to variables that highlight Bourdieu's forms of capital, and capabilities as mentioned by Sen. Special reference was made to the TIMSS 2015 contextual framework. The analysis used a hierarchical linear modelling technique which is uniquely able to differentiate between variation within and between schools, indicative of inequalities between and within schools.

The current study employed the forms of capital identified by Bourdieu and Sen's capabilities approach to identify school contextual variables which could be converted into capabilities, which will in turn provide students with an opportunity to achieve functionings. Two of the three types of capital (economic and social) were found to be significantly associated with academic achievement: for economic capital, school resources were identified; and within social capital, dimensions of school climate were identified as significant. The results show that school context matters, and that creating a school that is free of any form of violence, that places emphasis on academic achievement, and where discipline policies are adhered to, will provide students with the opportunity to achieve better functionings. The main aim of any school should be to provide a quality educa-

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tion to all students regardless of their home background or the school they attend—this is a sign of homogeneity between schools. From the results it is clear that by placing more emphasis on the use of resources and school climate, the variation between schools reduced significantly.

Introduction

After 1994 South Africa and its education system responded to social and educational inequalities that had a stranglehold on much of its society. At the time it was expected that the education system would essentially transform its previous inequalities by forming a system based on the Freedom Charter edict: ‘the doors of learning and culture shall be open to all’ (Badat & Sayed, 2014). The new government committed to transforming education for all, but it had inherited the social and economic structures of apartheid, which came with extensive inequality. For the past 25 years, the South African education system has experienced transformative changes, which were geared towards educational equality. Several policy changes were implemented to address school access, which was previously **highly racialised**. For example, the South African Schools Act of 1996 mandated that education be compulsory for all children between the ages of 6 and 15 years. Other policies which were transformed included the fees policy, governance policy and funding redistribution among schools.

In spite of these changes, some studies show that there has been insufficient progress in reducing inequality in the education system (Badat, 2012; De Waal, 2013; Sayed & Kanjee, 2013; Sehoole & Adeyemo, 2016).

Notwithstanding the findings from the aforementioned studies, it remains unclear in the literature how to reduce educational inequalities and encourage the emergence of educational success and opportunities.

This chapter thus argues that in evaluating present injustices, or rather persistent educational inequalities, adoption of a social justice perspective that is widely used to offer such explanations is beneficial. Social justice demands equality in educational discussions, analyses and policies. The intention is to position the pursuit of education equality through education successes and opportunities as central tents of a socially just education system. Understanding these contributory processes is augmented through the integration of Sen (1992) and Bourdieu (2006) human capability and forms of capital theories, respectively. The combination of Sen and Bourdieu’s tenets is a model that Hart (2012) developed to guide the understanding of social justice in higher education. We adopt it here to explain education inequalities and how to improve student functionings in basic education.

Within that perspective, this chapter examines how different forms of capital affect education success and/or emerging opportunities, ultimately reproducing educational inequalities. The research question for this chapter is as follows: What forms of capital can redress present inequalities in the South African basic education sector? In other words, what forms of capital predict the reproduction of educational/achievement inequality?

The aim of the chapter is to examine how inequality related to different forms of capital reproduces itself in selected educational outcomes, particularly mathematics. Empirical studies have established a positive relationship between possession of social, economic and cultural capital and academic achievement (Barone, 2006; Fritzlen, 2014; Tan & Liu, 2018). For example, students with economic capital or access to financial resources have higher academic achievement. For this chapter we evaluate the home socioeconomic status (SES), home study support, and instruction affected by resource shortages as economic capital. Social capital is examined through relationships that students have within their education experiences. These are examined using aspects of school discipline, teacher access to curriculum documents and a conducive learning environment as social capital. Cultural capital is access to cultural resources as well as familiarity with and knowledge of the dominant culture. One example is linguistic capital, which is derived from a student's proficiency in a formalised language (Bourdieu, 2006; Fritzlen, 2014).

The chapter's analysis is based on the Trends in International Mathematics and Science Study (TIMSS) data collected in 2015. Mathematics achievement is the dependent variable of interest. The analysis uses a multilevel modelling approach that specifies relations across multiple levels of the education system. This chapter is one of the first to apply the technique to quantify the combined Sen and Bourdieu framework. Studies that have focused on either or both of the Sen and Bourdieu frameworks are generally qualitative in nature (Gokpinar & Reiss, 2016; Hart, 2019; Hjellbrekke & Korsnes, 2009; Unterhalter et al., 2014; Veenstra, 2005; Vryonides, 2007), and hence this chapter intends to fill a gap that currently exists within the social justice domain.

Multilevel analysis takes the nested nature of educational data into account and associations at various levels (the student, class and school) can be tested (Raudenbush et al., 2004) without any of the loss of information that would be the case with simpler types of analysis such as Analysis of Variance (ANOVA). One of the benefits of multilevel analyses is the ability to explain variations in student achievement at different levels of the model, which is indicative of inequalities that exist in the system (McKeever, 2017; Spaull, 2013; Van der Berg et al., 2011). The models developed by the authors will provide some insight into how inequalities within the education system can be reduced.

Purpose and Contribution of the Chapter

Using multilevel modelling, this chapter empirically evaluates constructs of economic, social and cultural capital by applying Sen and Bourdieu's theoretical perspectives. The chapter provides three main contributions to the literature on academic achievement. First, the chapter extends previous research by providing a unified analysis through which the different forms of capital are associated with educational choices and success. Most previous studies analyse only one of these capitals for example, cultural capital in the case of Gokpinar and Reiss (2016), Jæger (2009) and Tan and Liu (2018). The second contribution of the chapter is that

it makes use of and integrates two frameworks, each of which has received limited empirical attention in the achievement literature. The chapter provides a novel theoretical model and a critical empirical test to explain students' opportunities in developing their education functionings. The model explains the mechanisms through which these constructs can provide a capability set to help students to convert resources into achievement functionings. The third contribution of the chapter is methodological and consists of a joint statistical modelling framework—the multi-level model—that analyses complex nested relationships (for example, student and school contextual factors) in the form of the different capitals.

Redressing Education Inequality: What Progress Has South Africa Made?

Historically, education in South Africa was differentiated and diversified on the basis of race and ethnicity (Sehoole & Adeyemo, 2016). This differentiation created two aspects that the post-apartheid government needed to redress (Badat & Sayed, 2014). Firstly, to address the obvious racial discrimination, which was the most visible form of inequality in the education system. Racial discrimination was addressed through affirmative action policies which prioritised access to basic education by black underprivileged students. Badat and Sayed (2014) ascertain that this approach redressed social order within the education system.

Secondly, the post-apartheid government needed to redress school financial spending. De Waal (2013) explains that in 1982 the apartheid government spent R146 on average per year on educating a black child, but R1211 was invested towards educating a white child. Such policies increased disparities in the education system. In 1996, the Ministry of Education commissioned a School Register of Needs¹ to determine the needs of schools, and it was reported that there were significant infrastructural backlogs, especially in schools for black children. For example, 65,380 classrooms needed to be built—an approximately 25% increase in the number of classrooms that existed at the time. The report further indicated that 60% of schools did not have access to electricity and telephones, 35% did not have access to water, 12% did not have access to toilets, and pit latrines constituted 47% of all school toilets (Badat & Sayed, 2014). Hence the new government needed to redistribute resources and privileges to redress unequal access and unequal opportunity—and ultimately outcomes.

In order to redress and/or transform the unequal access and opportunity in the education system, two efforts were established. The new government embarked on a number of policy changes, which began with the National Education Policy Act of 1996. This was followed up with several White and Green Papers, Acts and Regulations, all seeking to transform the national educational system. According to Badat and Sayed (2014), between 1994 and 2013 there were approximately 7 White Papers, 3 Green Papers, 26 Bills (of which 17 were amending bills), 35 Acts, 11

¹The School Register of Needs cited by the Education Rights Project; see <http://www.erp.org.za/hm/issue2-3.htm>.

Regulations, 52 Government Notices and 26 Calls for Comments that encompassed basic to higher education.

At implementation level the government began the process of transferring control of schools that were previously reserved for white persons to school governing bodies (Carrim & Sayed, 1992). In recent years there has been a rapid expansion of Grade R provisioning, with an increased focus on making Grade R universally accessible in South Africa (Department of Basic Education, 2019a). Attendance has doubled from about 242,000 in 2003 to 839,515 in 2017, and has reached an evenness where over 94% of Grade 1 students report having attended Grade R. Close to 99% of 7- to 15-year-old children attended an educational institution in 2016. Over 98% of students in this age group have been attending educational institutions since 2009, highlighting the near-universal attendance rates for compulsory education in South Africa. In 2017, 86% of 16- to 18-year-olds were attending educational institutions, compared to 82.6% in 2002.

Arguably, the new South African education system has advanced social justice within access by increasing participation rates for all races. However, social justice in access alone does not advance a holistic social justice education system. This is evident from research using three international assessments, i.e. TIMSS, the Progress in International Reading and Literacy Study (PISA) and the Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ). SACMEQ results indicate that South African students are among the lowest-performing participants in Mathematics and Literacy when compared to their southern and eastern African counterparts (Department of Basic Education, 2017).

The TIMSS data suggest that although South African students² were acquiring Mathematics and Science knowledge, the pace at which they are doing so has been slow (Isdale et al., 2017; Zuze, Reddy, Visser, Winnaar, & Govender, 2017). Results show that two-thirds of South African students do not acquire the minimum set of Mathematics or Science skills by Grade 9 (Zuze et al., 2017). In fact, van der Berg and Gustafsson (2019) also note that apart from students who attend fee-paying public schools and independent schools, and a small minority of schools performing well in largely black areas, the quality of education remains low. Students in fee-paying schools perform better, and their scores improve with successive years of schooling (Motala, 2015). All of these analyses show that there is still a marked disparity in learning attainment between students from rich and poor households.

There has been change in how the DBE perceives the importance of social justice in education. The current strategic direction of the DBE emphasises the need to include the six principles of social justice in their work. The six principles include quality, efficiency, access, redress, equity and inclusivity (Department of Basic Education, 2019b). Aside from the department's strategic directions, the most recent documents that address social justice include the DBE's Action Plan 2019: Towards the realisation of schooling 2030 (Department of Basic Education, 2015) and the chapter in the National Planning Commission's National Development Plan 2030 (National Planning Commission, 2012). Despite the advances in access, there is

²In South Africa, students are called "learners". These terms (students and learners) are used interchangeably here.

consensus from the DBE that inequalities persist with regard to educational opportunities and outcomes, which is what this chapter examines. The next section presents the theoretical framework that should enable an understanding of equality in education.

Revisiting Social Justice in South African Schools: Juxtaposing Sen and Bourdieu

This chapter draws on the theoretical framework of Sen's concept of capability (Sen, 1985a, 1985b) and Bourdieu's forms of capital (Bourdieu, 2006).

The discussion highlights the importance of having the three forms of capital, which in this chapter include the economic, social and cultural capital, to achieve equality in education, as illustrated in Fig. 1. Sen's (1985a, 1985b) framework proposes a paradigm shift that broadens attention to include whether individuals have real opportunities to achieve a valued way of living.

Using the Sen–Bourdieu Theory to Examine Educational Inequality

Bourdieu (2006) refers to capital as 'a set of usable resources and powers'. Capital is accumulated over time, and is essential in producing and reproducing life opportunities in the form of profits (Bourdieu, 1984). Bourdieu acknowledges that capital is a valuable resource, particularly when it is scarce, and thus has implications on one's structure and functioning of the social world.

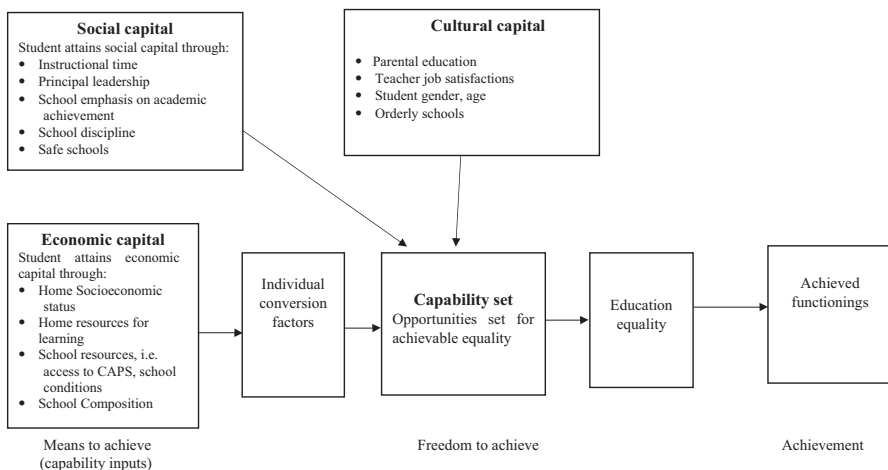


Fig. 1 The capability approach and forms of capital. CAPS Curriculum Assessment Policy Statements. (Adopted from Robeyns (2005), with insights from Bourdieu (2006) and Sen (1985b))

In contrast, Sen (1985b) argues that the mere existence of resources does not guarantee educational success for a given individual; it would depend on how well suited the resources are to the individual's needs. For example, if the language of instruction is different from the student's home language, the student may feel left out at school. Sen argues for the need or importance of one's capability. This chapter applies the concept of academic capital and uses academic achievement as a proxy for academic capital. It is important to note that a functioning is an achievement, while a capability is the ability to achieve (Sen, 1992). Capabilities are opportunities students would have to achieve. Sen suggests that the capability concept has to reflect an individual's freedom that points to the possibilities open to the action of a person. Sen argues that his capability approach to justice relies on a capability set that creates opportunities. Thus, in this chapter, we argue that creating opportunities should start from capability inputs which should be equal to each student. We regard these capability inputs as capitals and link Bourdieu's framework to Sen.

In fact, Bourdieu acknowledges that achieving functionings can only be attained by taking into account all forms of capital. Bourdieu distinguishes three fundamental forms of capital: economic, social and cultural. Economic capital is regarded as economic resources that students have access to. The concept is understood in terms of exchange values such as income, and assets that are directly convertible into money and may manifest in family income and wealth (Caro, Sandoval-Hernández, & Lüdtke, 2014; Orr, 2003; Paulsen & John, 2002).

Economic capital can be captured in part by SES. Social capital centres around social networking and relationships, but the notion of social capital implies potential resources and assistance required. Bourdieu's explanation of social capital entails social relationships and resources which facilitate the existence of relationships (Bourdieu, 2006). The driving tenet in social capital is that individuals do not exist independently of each other. Cultural capital is the symbolic resources that are passed from generation to generation (Bourdieu, 2006; Bourdieu, Passeron, & Nice, 1977). As an analogy, one form of cultural capital is linguistic capital, one's proficiency in a given language (Bourdieu, 2006; Fritzlen, 2014). Bourdieu argues that linguistic codes are associated with parental occupational status and the value attached to education. A further example of cultural capital is the amount of time spent reading for academic aspirations or even for pleasure.

For completeness, we argue that Sen's capability approach when matched with Bourdieu, enables a person to have a command over resources that would then provide the freedom/opportunities and ability to convert resources into functionings. In fact, Walker and Unterhalter (2007) explain that the capability approach requires that we probably do evaluate functioning, but without prescribing to learners the choices they make about their own lives. Hence, the chapter's evaluation of equality within the social justice perspective does then take account of freedom in opportunities as much as observed choices. Thus, the capability approach offers a method to evaluate real educational advantage, and equally to identify disadvantage, marginalisation and exclusion.

In addition to capability, Bourdieu argues that means and functionings can further be achieved through the broad forms of capital such as social capital, cultural

capital and economic factors, which in this case we regard as home and school resources. Pham (2019) relates functioning of cultural recognition, for example, feeling respected in a school community; or representational aspects, such as having a voice in the school community; or structural aspects, such as being able to enrol in the local school; or material aspects, for example, having access to books or scientific equipment. Robeyns (2005) as cited in Pham (2019) argues that the capability approach recognises that education does not take place in a vacuum, and social structures such as schools, selection of students, schooling practices and patterns of racial, economic and gender inequality are conditioning factors of student participation that contribute to uneven educational outcomes. Even for persons with good educational outcomes, a variety of other factors in their family and community life influence their prospects (Pham, 2019).

In combining Bourdieu's forms of capital with Sen's capabilities, it is expected that better means to freedom of opportunity sets can be realised for students to achieve equitable choices in school. These theories offer a strong understanding of students' interactions, which lead to unearthing of inequality in a sector such as education. In conclusion, the capability approach emphasises the role of individual agency and choice, but Bourdieu's forms of capital remind us that the freedom of agency, which students have, can be qualified and constrained by social, political and economic factors and opportunities.

Student Academic Achievement across Forms of Capital

This section briefly discusses literature on student academic achievement in three subsections: economic, social and cultural capital. In each subsection, the effects of each form of capital on student academic achievement are reviewed.

How Does Economic Capital Influence Student Academic Achievement?

Education researchers link assets and income to this construct, and variables referring to the possession of consumer goods in the household are indicators of a family's economic capital. In addition, parental education and occupational status are usually regarded as resources that can be transformed into income. The assumption is that the greater the economic capital in a family, the better the physical conditions which support the cognitive development of the student and hence result in higher academic attainment. In fact, Caro et al. (2014) reported a strong association of possession of assets with student achievement. Moreover, other studies have found that low SES is more likely to shape lower levels of aspiration, causing low education attainment (Kao & Tienda, 1998; MacLeod, 2018).

How Does Social Capital Influence Student Academic Achievement?

Studies show that there are mixed findings about social capital, ranging from a positive impact to no association. Researchers who concur with Bourdieu's social capital theory agree that other forms of capital (specifically cultural capital) do shape

social capital. Studies show that students from low SES lack support owing to weak networks, which affects their educational attainment. Caro et al. (2014) reported a positive association of parents' literacy support activities with achievement. Parent-child communication had a negative loading to social capital. However, parent-child communication and interaction had a positive factor loading to the social capital construct.

How Does Cultural Capital Influence Student Academic Achievement?

According to Bourdieu et al. (1977) cultural reproduction theory, students with a better family background inherit most of their socially valuable cultural patterns from their parents. This cultural capital allows students to achieve better academic achievement scores. Evidence shows that parental education is a strong indicator in students' educational attainment (Hamrick & Stage, 2004). Parents with university-level education may value educational achievement, and their own experience may assist their children to achieve educational heights. Family background factors affect students' academic achievement. High achievers often receive more encouragement and support from their parents. In this chapter, we extend the inquiry of cultural capital to include teacher preparation and experience, teaching practices, instructional engagement, student motivation and safety, and order and discipline among students.

Methodology

The TIMSS 2015 Grade 9 data were used in this chapter and included data extracted from the student (both background and Mathematics achievement data), principal and teacher contextual questionnaires. The Human Sciences Research Council (HSRC) was responsible for conducting the study in 300 schools across South Africa on behalf of the International Association for the Evaluation of Educational Achievement (IEA). In addition to all of the international data, the authors had access to data on variables included by the HSRC research team which were specific to the South African education system. The sample consisted of 12,514 students, 292 principals and 334 Mathematics teachers, drawn using a two-stage stratified systematic sampling methodology, explicitly stratified by province, language of learning and teaching (either English or Afrikaans) and school type (public or independent). Details of the sampling methodology can be obtained from the Methods and Procedures Report by Martin, Mullis and Hooper (2016).

Considering the hierarchical nature of the TIMSS data, and given that school and teacher characteristics were used to explain differences in student-level Mathematics achievement, using simple linear regression would have been inappropriate (Van Dusen & Nissen, 2019). Also, research shows that large variations in performance are observed from one South African school to another (Van der Berg, 2008). An analytical method that is able to explain these differences was considered in this analysis. Multilevel models using the Hierarchical Linear Modelling (HLM)

software developed by Raudenbush, Bryk and Congdon (2013) were employed in the current analyses. Using a two-level HLM model, with students at the first level and principals and teachers at the second level, the software is able to differentiate between variations in performance that occur between schools. In the case of the current analysis, the level 1 variables were included as controls in the model.

The chapter employed the Sen-Bourdieu conceptual framework discussed earlier to comprehend the TIMSS results, by investigating the relationship between the different forms of capital and students' achievement, which in the context of the framework is referred to as achieved functionings.

Dependent Variable

The TIMSS Mathematics achievement was used as the dependent variable in the present chapter. Since the first cycle of the study was conducted in 1995, the IEA has established a vast array of items from one TIMSS cycle to the next, and to reduce test learning effects and student fatigue, students are only tested on a subset of items using a matrix sampling design. Item response theory was used to compute five plausible values for each student in Mathematics to represent a multiple estimation of how the student might have performed if they completed all the test items. All five plausible values were taken into consideration in the present chapter, since the HLM software makes provision for this possibility. The software runs a model on each of the plausible values and then creates an average for reporting purposes.

Independent Variables

The TIMSS 2015 Contextual Questionnaire Framework (Martin, Mullis, & Hooper, 2016) includes three broad themes: the student home context, the school and class context, and the student characteristics and attitudes. The focus of this chapter was on the school and class context as described in the TIMSS framework, by attempting to situate it within Bourdieu's forms of capital (see Appendix 1).

For the purposes of the analysis, variables were recoded into dichotomies with a value of 1 representing a positive or desirable response and a value of 0 otherwise. These included the following variables:

- Type of school (1 = Fee-paying, 0 = No-fee)
- Principal's ability to manage conflict (1 = Yes, 0 = No)
- Support provided to teachers by the principal (1 = Yes, 0 = No)
- Safe schools, identified by students being bullied or not (1 = Yes, 0 = No)
- Teacher job satisfaction (1 = Yes, 0 = No)
- Access to curriculum documents (1 = Yes, 0 = No)
- Student access to Mathematics textbooks (1 = Yes, 0 = No)
- Teacher confidence (1 = Confident, 0 = Not confident)

There are two types of continuous variables included in the analysis: those created by the authors and those created by the IEA. Variables created by the IEA were

kept unchanged, and variables created by the authors used the principal component analysis (PCA) method presented by Taylor and Yu (2009). These variables were teacher support, teacher–teacher collaboration and teacher confidence. For ease of interpretation, all variables created using PCA were standardised to a mean of 0 and standard deviation of 1. Since one intact class is selected within a sampled school, it meant that the Mathematics teacher directly linked to the sampled class was included in the sample.

School and class context for learning included at level 2:

- School SES (economic capital): A dichotomised variable derived from a poverty index assigned to schools (1 = Fee-paying, 0 = No-fee)
- Principal leadership: Support provided to teachers (social capital), conflict management (social capital)
- School climate: School emphasis on academic success (social capital), safe and orderly (cultural capital), discipline (social capital), bullying (social capital), teacher job satisfaction (cultural capital)
- School resources: Access to curriculum documents (economic capital), school conditions and resources (economic capital), instruction affected by shortage of resources (economic capital), textbook access (economic capital)
- Teaching practices: Classroom teaching practices (social capital), confidence in teaching (social capital), teacher-to-teacher collaboration (social capital)

Results

Only variables that were significant were kept in the final models provided in Table 1. Three models were developed in the analysis. The first was a model that only included the dependent variable (with no independent variable). From this model one is able to determine the variance in achievement that exists between schools, which is indicative of inequalities that exist; the results of this model are explained in section “Inequalities and Achieved Functionings” below. The second model includes the level 1 (or student level) control variables, with the school SES included at level 2. This model was run to determine the variance in average achievement between schools explained according to school SES. The third model incorporates the remaining level 2 (school and teacher) variables into the model, to see if the variables we selected could further reduce the variation in achievement.

Inequalities and Achieved Functionings

A unique attribute of multilevel analysis is its ability to partition total variance in achievement into variance between schools and within schools. Throughout the chapter variance will be explained as a percentage; variations closer to 100% are indicative of high inequalities between schools. The results show that variation in achievement between schools in South Africa is very high at 61% (Table 1). The magnitude of the variation (range of scores) in average achievement between schools

Table 1 HLM results

	Bourdieu's forms of capital	Base model (Model 1)	Level 1 with school type (Model 2)	Level 2 (Model 3)
Fixed effects				
Intercept		378***	383.17***	322.99***
Student age	Cultural		-16.01***	-13.18
Gender (1 = girl, 0 = boy)	Cultural		-10.13***	-8.90
Home socioeconomic status	Economic		4.08**	2.67
Fee-paying schools vs no-fee schools	Economic		90.83***	55.53***
Safe schools (low to no incidence of bullying)				53.36***
School emphasis on academic achievement	Social			21.96**
Instruction affected by resource shortages	Economic			-32.96*
School discipline	Social			-12.31*
Teacher access to curriculum documents	Social			14.88*
Random effects		Variance component		
Intercept		4922.50	2305.67	1545.59
Home socioeconomic status slope			19.04	18.89
Level-1		3052.54	2726.17	2728.40
Variance explained		61%	53%	27.88%

Source: TIMSS 2015 data (authors' calculations)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

with no independent variables added to the model is (240.5, 515.5), which again highlights inequalities in the system. One of the main aims of any educational system is to create homogeneity between schools, which would mean finding ways to reduce variances. In 2008, using data from international studies like SACMEQ and the Progress in International Reading Literacy Study (PIRLS), Van der Berg compared the variance between schools across a number of countries, and found that the variation was much higher between South African schools than the other countries he considered (Van der Berg, 2008). Analysis of the TIMSS data for a number of countries, conducted by Zopluoglu in 2012, showed similar results (Zopluoglu, 2012). In most countries, variations within schools were higher than variations between schools; however, in South Africa the opposite is true. Where schools in most countries proved to be more homogeneous; this was not the case in South Africa.

All public schools in South Africa have been assigned a quintile ranking, which signifies the poverty level of the school and the community that surrounds it. Schools with quintile ranking of three or less are referred to as 'no-fee' schools, and schools with quintiles 4 or 5 are referred to as 'fee-paying' schools. For the purposes of the current analyses, the independent or private schools which formed part of the

TIMSS sample were regarded as ‘fee-paying’ schools. The results show that students in ‘fee-paying’ schools score on average 90.8 points (Table 1) higher than students in ‘no-fee’ schools. The model also shows that the school SES variable accounts for 53% of the variation in mean achievement, which also shows that the magnitude of the variation is (289, 477). This shows a reduction when compared to the model with no independent variables added to it. In addition, when the remaining variables are added to the model (model 3), the achievement gap between ‘fee-paying’ and ‘no-fee’ schools reduces to 55.53 points on average.

Interpretation of the Control Variables (Level 1 Model)

Three variables were selected to serve as controls in the analysis, namely; age, gender and home SES. All of these were significantly associated with achievement with age showing the largest achievement difference, with students who are older obtaining on average 16 points lower than younger or grade age-appropriate students.

The analysis also shows a significant gender difference, with boys performing better on average than their female counterparts. Girls score on average 9 points lower than boys.

Also, the achievement is small; the results show that home SES and achievement are positively associated, with students from higher SES households performing better than learners from lower SES homes. In the current analysis, home SES was calculated based on resources at home.

Forms of Capital and Achieved Functionings (Level 2 Model)

This section will explain the results from model 3 in relation to the three forms of capital outlined by Bourdieu.

Economic Capital

From the list of school and class level variables (outlined in Appendix 1), two of the variables were significantly associated with average achievement. Teachers were asked whether their instruction was affected by resource shortages. The results show that students who are taught by teachers who say that instruction is affected by resource shortages score on average 33 points lower than students taught by teachers who are not affected by resource shortages.

Students who are taught by teachers who have constant access to the curriculum documents score on average 14.88 points more than students taught by teachers who did not have access to curriculum documents.

Again, when we link the results from the economic capital cluster to Sen and Bourdieu’s theories, it shows that economic capital does affect achievement functionings and perhaps would further affect a student’s capability to achieve. Sen clearly stated that the mere existence of resources does not guarantee educational success, and the results prove exactly this concept. The results elude to the fact that a lack of resources does in fact hinder the ability of the teacher to teach the students adequately, and thus not being able to create opportunities to reach achieved

functionings. Hence, we would expect a connection from a positive association between economic capital and achievement to greater student capability in educational attainment.

Social Capital

Three of the variables included as social capital at the school level were significantly associated with achievement and are also dimensions of the school climate. Of these three variables, attending a safe school is the strongest predictor of achievement. Students who feel safe and are not bullied at school score on average 53.36 points higher than students who do not feel safe and encounter incidences of bullying at school.

The results show that students who attend schools where an emphasis is placed on academic achievement score on average 21.96 points more than students who attend schools where very little emphasis is placed on academic achievement.

Students who attend schools where discipline is a problem score on average almost 12.31 points less than students who attend schools where discipline is not an issue.

Both Sen and Bourdieu highlight that context matters and profiles the values and goals of individuals within that context. Similarly, the schools that students attend (their context) play a role in converting material resources into capabilities by providing the student with the opportunity to achieve functionings. In the case of the current results, school climate speaks directly to the schools 'context', and by providing students with an environment 'context' that is safe, one that places emphasis on academic achievement and having firm and enforced discipline policy in place, will enable students to convert these opportunities into achieved functionings.

Reducing Inequality to Promote Achieved Functionings

As previously stated, one of the main aims of an education system is to achieve homogeneity between schools, meaning that irrespective of the school a student attends, the quality of education they are provided with will be the same. This is, however, not the case in South Africa—as has been shown in the analysis, with large variations occurring between schools. The aim of the multivariate analysis (or multilevel analysis as in this chapter) is to identify variables that would explain (reduce) the variation between schools.

It is clear that the quality of education a child receives is still dependent on the type of school the child attends. Students who attend 'fee-paying' schools obtain higher scores on average than students who attend 'no-fee' schools—and higher achievement is indicative of higher-quality education.

In order for the education system to become more homogeneous, the achievement gap between these two school types needs to be reduced. The results have shown that by focusing on issues of school climate and access to and use of school resources, one would expect the achievement gap to be reduced from 90.8 points to 55.5 points on average.

Discussion

This chapter has shown strong evidence that there is a reproduction of inequality in the basic education system, but within that, there are opportunities that the Department of Basic Education could leverage for better educational attainment or achievement functionings. Two issues that the theoretical framework provides us. First, the theoretical framework provides the sense that students' capability to achieve functionings is reflected in the real opportunities or freedom at hand. The sense of opportunity used here should be understood in the positive sense, that is, in terms of how capitals are enablers to achievement functionings. Secondly, the ability of students to convert those capitals requires an enabling environment that schools should provide, for example provision of adequate academic resources both for students and teachers and providing enough instruction time to learners.

Education is one essential way to enhance reasoned agency, which helps individuals to achieve substantive freedom and expand capabilities (Mok & Jeong, 2016). The main aim of the study was to determine the economic, social and cultural capital available to students that could be converted into opportunities, which would ultimately result in achieved functionings.

However, the chapter emphasises how inequality in capital reproduces itself in selected educational outcomes. Although the South African education system is responsible for reducing differences between children from wealthy and impoverished backgrounds, it is also responsible for magnifying these differences. This implies that the education system, characterised by relatively poor educational outcomes, is perpetuating inequality and as a result failing too many of its children, particularly those from lower socioeconomic backgrounds. The South African education system should provide an enabling environment addressing school and class factors, which according to Sen can be viewed as opportunities capable of reducing inequality.

Economic Capital

The student SES variable and the school SES compare well with Bourdieu's notion of economic capital related to wealth and economic assets. The implication is that higher economic capital is associated with better-resourced schools and better quality education provided to students. Students in high SES home are provided with a richer set of learning opportunities and mode of access to written materials for reading and other resources that engage the child's curiosity (Willms, 2006). The final model (Fig. 1) shows that for many South African students, their educational prospects are closely tied to how well-resourced their schools are. It is clear from the results that there is an opportunity for schools to mediate the relationship between home SES and achievement, thus reducing the impact of home SES.

The gap in school resources between learners in the 'no-fee' and 'fee-paying' components of the education system remains wide, inferring that schools with more physical resources to draw upon and better facilities devoted to education are at an advantage. This should be encouraging to policymakers, that resources really matter for educational quality.

However, we should be cognizant of Sen's (1985b) contention that the mere existence of resources does not guarantee educational success for a given individual—that would depend on how well suited the resources are to the individual's needs. It is imperative that policies and strategies centring on resource allocation should favour poor-performing historically disadvantaged schools. This may help schools to reduce educational inequalities and to direct resources and the transfer and activation of forms of capital in ways that seek to benefit the most disadvantaged students (Hart, 2019).

Social Capital

Our findings confirm the importance of school resources but acknowledge that educational success goes beyond improving resource access. An important finding from this study is that learners attending schools with a positive school climate (emphasis on academic success, fewer disciplinary problems and fewer incidences of bullying) score on average higher than learners attending schools with a less than positive school climate. A good or conducive school climate can provide support or encouragement to the school principals, teachers, personnel and students to perform various activities according to their respective duties and functions (Syahril & Hadiyanto, 2018). According to Darling-Hammond and Cook-Harvey (2018), this will entail adopting standards or other guidance for social, emotional and cognitive learning that clarifies the kinds of competencies students should be helped to develop and the kinds of practices that can help them accomplish these goals.

A higher emphasis on academic success is associated with positive attitudes of teachers, parents and learners at the school in relation to teachers' understanding of the curriculum, parental and teacher expectations, parental involvement, learners' commitment to academic standards and learners' respect for peers who excel in school. Winnaar, Arends and Beku (2018) argue that learners who are more academically engaged and have confidence in learning mathematics are less likely to experience bullying. Initiatives need to be established in the schooling system to curb the spate of bullying occurring within schools and to improve schools' attitudes towards academic success. Schools need to make a concerted effort to create an environment where learners and parents feel welcome, and ensure that policies focused on safety and discipline in schools are strongly adhered to. Darling-Hammond and Cook-Harvey (2018) argue that a strong, stable, diverse, well-prepared teaching and leadership workforce is perhaps the most important ingredient for a positive school climate that supports effective whole child education.

Cultural Capital

In our model we included cultural capital factors such as parental encouragement and support for students, and extended this to include teacher preparation and experience, teaching practices, instructional engagement, student motivation and safety, and order and discipline among students. These cultural capital factors allow students to attain better academic achievement scores. However, our model shows no

significant relationships between the cultural capital factors (see Appendix 1) and learner achievement.

We have to acknowledge that there may be characteristics of the TIMSS 2015 population that caused the results to turn out differently than expected, or that there could be outside factors (i.e. confounds) that we did not control for, that could explain why our findings differ from the literature we cited above.

Conclusion and Implications

Unequal scholastic values and attitudes, and differences in cultural resources valued in the education system mean that students of different social origin are not equally positioned to benefit from equal access to education. In South Africa, the basic education system as it stands is as much about capability deprivation as development, and there is an urgent need for educational reform. Our contention is that a quality education system should support a student by developing their social, emotional, cognitive and communication abilities.

Highlighting the importance of self-regulatory and socio-emotional skills, and other non-tangible assets alongside academic achievement may help improve performance by positively influencing the ways in which young people experience their learning environment. Schools will have to develop norms and standards for safe, culturally responsive classroom communities that provide students with a sense of physical and psychological safety, affirmation and belonging.

Affirmative policies which were mainly responsible for improving access to school resources (increasing learner enrolment) can continue to play an essential role in improving educational quality and thus reducing resource inequality. Our recommendation in this regard is that the use of these resources are closely monitored to ensure that all students are equally benefiting from the country's wealth. These types of policies can assist policymakers towards establishing an equitable education system.

Education can only be considered a basic capability if it specifically addresses the process of developing the capabilities necessary to live a life one has good reason to value. Deficiencies in important capabilities such as education during childhood reduce well-being even in the future (poverty as deprivation of capabilities) and have larger societal implications. Ultimately, school and classroom processes can be viewed as opportunities as suggested by Sen, and are capable of reducing the education inequality.

Limitations of the Study

As with all studies, the current chapter suffers from some limitations. The first key limitation pertains to what Juslin, Winman, and Olsson (2000) refer to as *naïve empiricism*. In simple terms, Juslin et al. (2000) imply that studies suffer from naïve empiricism when researchers oversimplify complex phenomena and draw unwarranted conclusions based on empirical observations. In the context of the present chapter, it is assumed that the current forms of capitals do reproduce educational

inequalities. However, the established associations between the different forms of capital and student achievement should not be viewed as evidence of a cause-effect relationship. Longitudinal data would be well suited to fully understand the cause-effect relationship of the different forms of capital with student achievement. The second limitation pertains to the scope of the study. The current inequality could be due to other disparities in educational achievement and in the general education system, and not necessarily the selected forms of capital studied in this chapter. In addition, the scope is limited to South Africa and hence the current findings can only be generalised within the South African basic education system.

Appendix 1: Variable Selection in Line with TIMSS Framework and Forms of Capital

TIMSS framework	TIMSS framework (sub)	Variables used	Source	Variable type	Capital form
Home and student characteristics	Gender	Girl	Learner	Dichotomy	Cultural
	Home resources	SES (home)	Learner	Continuous	Economic
	Student age	Age	Learner	Continuous	Cultural
School and classroom context	School composition (SES)	Fee-paying	School	Dichotomy	Economic
	Instructional time	Loss of instructional time due to extra murals and meetings	Teacher	Dichotomy	Social
	Principal leadership	Support provided to teachers	Teacher	Dichotomy	Social
		Conflict management	Teacher	Dichotomy	Social
	School climate	School emphasis on academic success	School	Continuous	Social
		Orderly schools	Teacher	Continuous	Cultural
		Discipline	School	Continuous	Social
		Safe schools (low to no incidences of bullying)	Learner	Dichotomy	Social
		Teacher job satisfaction	Teacher	Dichotomy	Cultural
	School resources	Access to CAPS docs	Teacher	Dichotomy	Economic
		School conditions and resources	Teacher	Continuous	Economic
		Instruction affected by shortage of resources	School	Continuous	Economic
		Textbook access	Teacher	Dichotomy	Economic
	Teaching practices	Classroom teaching practices	Teacher	Continuous	Social
		Confidence in teaching	Teacher	Dichotomy	Social
Teacher-to-teacher collaboration		Teacher	Continuous	Social	

References

- Badat, S. (2012). Redressing the colonial/apartheid legacy: Social equity, redress and higher education admissions in democratic South Africa. In H. Zoya & M. C. Nussbaum (Eds.), *Equalizing access: Affirmative action in higher education in India, United States, and South Africa*. New Delhi: Oxford University Press.
- Badat, S., & Sayed, Y. (2014). Post-1994 South African education: The challenge of social justice. *The Annals of the American Academy of Political and Social Science*, 652(1), 127–148. <https://doi.org/10.1177/0002716213511188>
- Barone, C. (2006). Cultural capital, ambition and the explanation of inequalities in learning outcomes: A comparative analysis. *Sociology*, 40(6), 1039–1058. <https://doi.org/10.1177/0038038506069843>
- Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Cambridge, MA: Harvard University Press.
- Bourdieu, P. (2006). The forms of capital. In H. Lauder, P. Brown, J. A. Dillabough, & A. H. Halsey (Eds.), *Education, globalization, and social change*. Oxford: Oxford University Press.
- Bourdieu, P., Passeron, J.-C., & Nice, R. (1977). Reproduction in education, society and culture. In *Theory, culture & society* (Vol. 1, R. Nice, Trans.). London: Sage.
- Caro, D. H., Sandoval-Hernández, A., & Lütke, O. (2014). Cultural, social, and economic capital constructs in international assessments: An evaluation using exploratory structural equation modeling. *School Effectiveness and School Improvement*, 25(3), 433–450. <https://doi.org/10.1080/09243453.2013.812568>
- Carrim, N., & Sayed, Y. (1992). The Model B schools: Reform or transformation. *Work in Progress*, 14, 5–9.
- Darling-Hammond, L., & Cook-Harvey, C. M. (2018). Educating the whole child: Improving school climate to support student success. Palo Alto, CA: Learning Policy Institute
- De Waal, M. (2013). A school journey into Eastern Cape's darkest heart. *Daily Maverick*. Retrieved from <https://www.dailymaverick.co.za/article/2013-04-30-517f08545f703/>
- Department of Basic Education. (2015). *Action plan 2019 towards the realisation of schooling 2030: Taking forward South Africa's National Development Plan 2030*. Pretoria, Republic of South Africa: Government Printer Pretoria.
- Department of Basic Education. (2017). *The SACMEQ IV project in South Africa: A study of the conditions of schooling and the quality of education*. Pretoria, South Africa: SACMEQ. Retrieved from http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iv/national-reports/sacmeq_iv_project_in_south_africa_report.pdf
- Department of Basic Education. (2019a). *Annual performance plan 2019/2020*. Retrieved from Pretoria, Republic of South Africa <https://www.education.gov.za/LinkClick.aspx?fileticket=-qh1hBO1rSM%3D&tabid=92&portalid=0&mid=4358>
- Department of Basic Education. (2019b). *Strategic direction in the basic education sector* [Press release]. Retrieved from <https://www.education.gov.za/Newsroom/Speeches/tabid/950/ctl/Details/mid/8127/ItemID/5972/Default.aspx>
- Fritzen, K. A. (2014). *Cultural capital and its relationship to academic achievement: The case of Shelby county high schools*.
- Gokpinar, T., & Reiss, M. (2016). The role of outside-school factors in science education: A two-stage theoretical model linking Bourdieu and Sen, with a case study. *International Journal of Science Education*, 38(8), 1278–1303. <https://doi.org/10.1080/09500693.2016.1188332>
- Hamrick, F. A., & Stage, F. K. (2004). College predisposition at high-minority enrollment, low-income schools. *Review of Higher Education: Journal of the Association for the Study of Higher Education*, 27(2), 151–168. <https://doi.org/10.1353/rhe.2003.0058>
- Hart, C. S. (2012). *Aspirations, education and social justice: Applying Sen and Bourdieu*. A&C Black.1441165452.

- Hart, C. S. (2019). Education, inequality and social justice: A critical analysis applying the Sen-Bourdieu Analytical Framework. *Policy Futures in Education*, 17(5), 582-598. <https://doi.org/10.1177/1478210318809758>
- Hjellbrekke, J., & Korsnes, O. (2009). Quantifying the field of power in Norway. In *Quantifying Theory: Pierre Bourdieu* (pp. 31-45). Springer, Dordrecht.
- Human Sciences Research Council (HSRC) (2015). Trends in International Mathematics and Science Study 2015. bsgzafm6.sav. Learner Background. Pretoria South Africa. Human Sciences Research Council. 2016
- Isdale, K., Reddy, V., Juan, A., & Arends, F. (2017). TIMSS 2015 Grade 5 national report: understanding mathematics achievement amongst Grade 5 learners in South Africa. HSRC Press. <http://repository.hsrc.ac.za/handle/20.500.11910/11847>
- Jäger, M. M. (2009). Equal access but unequal outcomes: Cultural capital and educational choice in a meritocratic society. *Social Forces*, 87(4), 1943-1971.
- Julian, P., Winman, A., & Olsson, H. (2000). Naive empiricism and dogmatism in confidence research: A critical examination of the hard-easy effect. *Psychological Review*, 107(2), 384-396. <https://doi.org/10.1037/0033-295X.107.2.384>
- Kao, G., & Tienda, M. (1998). Educational aspirations of minority youth. *American Journal of Education*, 106(3), 349-384. <https://doi.org/10.1086/444188>
- Martin, M., Mullis, I., & Hooper, M. (2016). Creating and Interpreting the TIMSS 2015 Context Questionnaire Scales. In METHODS AND PROCEDURES IN TIMSS 2015 (pp. 15.1-15.312). <http://timssandpirls.bc.edu/publications/timss/2015-methods.html>
- MacLeod, J. (2018). *Ain't no makin' it: Aspirations and attainment in a low-income neighborhood*. Routledge. 0429975082
- McKeever, M. (2017). Educational Inequality in Apartheid South Africa. *American Behavioral Scientist*, 61(1), 114-131. <https://doi.org/10.1177/0002764216682988>
- Mok, K., & Jeong, W. (2016). Revising Amartya Sen's capability approach to education for ethical development. *Asia Pacific Education Review*, 17(3), 501-510. doi: <http://10.1007/s12564-016-9449-2>
- Motala, S. (2015). Equity, access and quality in basic education: A review. *Journal of Education*, 61, 159-175.
- National Planning Commission. (2012). *Diagnostic report*. Pretoria, Republic of South Africa
- Orr, A. J. (2003). Black-white differences in achievement: The importance of wealth. *Sociology of Education*, 76(4), 281-304. <https://doi.org/10.2307/1519867>
- Paulsen, M. B., & John, E. P. S. (2002). Social class and college costs. *The Journal of Higher Education*, 73(2), 189-236. <https://doi.org/10.1080/00221546.2002.11777141>
- Pham, L. (2019). Capital and capabilities in education: Re-examining Australia's 2015 PISA performance and context assessment framework. *Policy Futures in Education*, 17(5), 599-617. <https://doi.org/10.1177/1478210318808615>
- Raudenbush, S. W., Bryk, A. ., & Congdon, R. (2013). HLM 7.01 for Windows [Computer software] (7.01). Skokie, IL: Scientific Software International, Inc.
- Raudenbush, S., Bryk, A., Cheong, Y. F., Congdon, R., & du Toit, M. (2004). HLM 6: Hierarchical Linear and Nonlinear Modeling. Scientific Software International Inc. <https://books.google.co.za/books?hl=en&lr=&id=VdmVtz6Wtc0C&oi=fnd&pg=PA7&dq=ssi+hlm+manual&ots=kUTPdSRO0c&sig=i0Y2EUYXvfgswGoe9Bgo-3Uq-ao#v=onepage&q=ssihlmmanual&f=false>
- Robeyns, I. (2005). The capability approach: A theoretical survey. *Journal of Human Development*, 6(1), 93-117. <https://doi.org/10.1080/146498805200034266>
- Sayed, Y., & Kanjee, A. (2013). An overview of education policy change in post-apartheid South Africa. In Y. Sayed, A. Kanjee, & N. Mokubung (Eds.), *The search for education quality in post-apartheid South Africa: Interventions to improve learning and teaching* (pp. 3-58). Cape Town, Republic of South Africa: HSRC Press.
- Schoole, C., & Adeyemo, K. S. (2016). Access to, and success in, higher education in post-apartheid South Africa social justice analysis. *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique*, 14(1), 1-18.

- Sen, A. (1985a). Goals, commitment, and identity. *Journal of Law, Economics, & Organization*, 1(2), 341–355.
- Sen, A. (1985b). Well-being, agency and freedom: The Dewey lectures 1984. *The Journal of Philosophy*, 82(4), 169–221. <https://doi.org/10.2307/2026184>
- Sen, A. (1992). Capability and well-being. *The Quality of Life*, 1(9), 30–53.
- Spaull, N. (2013). Poverty trap; privilege: Primary school inequality in South Africa. *International Journal of Educational Development*, 33(5), 436–447. <https://doi.org/10.1016/J.IJEDUDEV.2012.09.009>
- Syahril, S., & Hadiyanto, H. (2018). Improving school climate for better quality educational management. *Journal of Educational and Learning Studies*, 1(1), 16–22.
- Tan, C. Y., & Liu, D. (2018). What is the influence of cultural capital on student reading achievement in Confucian as compared to non-Confucian heritage societies? *Compare: A Journal of Comparative and International Education*, 48(6), 896–914. <https://doi.org/10.1080/03057925.2017.1369392>
- Taylor, S., & Yu, D. (2009). The importance of socio-economic status in determining educational achievement in South Africa. In Stellenbosch Economic Working Papers (No. 09; 1). <http://www.ekon.sun.ac.za/wpapers/2009/wp012009/wp-01-2009.pdf>
- Unterhalter, E., G Ladwig, J., & Jeffrey, C. (2014). Aspirations, education and social justice: applying Sen and Bourdieu. In *British Journal of Sociology of Education* (Vol. 35, Issue 1, pp. 133–145). Routledge. <https://doi.org/10.1080/01425692.2013.856669>
- van der Berg, S., Burger, C., Burger, R., De Vos, M., Du Rand, G., Gustafsson, M., Moses, E., Shepherd, D., SPAULL, N., Taylor, S., van Broekhuizen, H., & Von Fintel, D. (2011). Low quality education as a poverty trap in South Africa.
- van der Berg, Servaas; (2008). How effective are poor schools? Poverty and educational outcomes in South Africa (No. 69). <https://www.econstor.eu/bitstream/10419/32027/1/558658229.pdf>
- van der Berg, S., & Gustafsson, M. (2019). Educational outcomes in post-apartheid South Africa: Signs of progress despite great inequality. In N. Spaull & J. D. Jansen (Eds.), *South African schooling: The enigma of inequality: A study of the present situation and future possibilities* (pp. 25–45). Cham: Springer.
- Van Dusen, B., & Nissen, J. (2019). Modernizing use of regression models in physics education research: A review of hierarchical linear modeling. *Physical Review Physics Education Research*, 15(2). <https://doi.org/10.1103/PhysRevPhysEducRes.15.020108>
- Veenstra, R., Lindenberg, S., Oldehinkel, A. J., De Winter, A. F., Verhulst, F. C., & Ormel, J. (2005). Bullying and Victimization in Elementary Schools: A Comparison of Bullies, Victims, Bully/Victims, and Uninvolved Preadolescents. *Developmental Psychology*, 41(4), 672–682. <https://doi.org/10.1037/0012-1649.41.4.672>
- Vryonides, M. (2007). Social and cultural capital in educational research: issues of operationalisation and measurement. *British Education Research Journal*, 33(6), 867–885. <https://doi.org/10.2307/30032797>
- Walker, M., & Unterhalter, E. (2007). The capability approach: Its potential for work in education. In M. Walker & E. Unterhalter (Eds.), *Amartya Sen's capability approach and social justice in education* (pp. 1–18). New York: Palgrave Macmillan.
- Willms, J. D. (2006). Learning divides. Ten policy questions about the performance and equity of schools and schooling systems. Montreal: UNESCO Institute for Statistics.
- Winnar, L., Arends, F., & Beku, U. (2018). Reducing bullying in schools by focusing on school climate and school socio-economic status. *South African Journal of Education*, 38(1).
- Zopluoglu, C. (2012). A cross-national comparison of intra-class correlation. *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi*, 3(1), 242–278.
- Zuze, L., Reddy, V., Visser, M., Winnaar, L., & Govender, A. (2017). TIMSS 2015 Grade 9 national report: understanding mathematics and achievement amongst Grade 9 learners in South Africa. HSRC Press. <http://www.hsrc.ac.za/en/research-outputs/view/9234>