Disability support and accessibility in ordinary schools in South Africa

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Abstract

Increased access to education among children with disabilities requires increased enrolment of children with disabilities in ordinary schools, the provision of disability support, more accessible school environments and re-training of teachers. There is however little available data on these aspects of disability support or accessibility in South Africa. This hinders accountability for policy implementation and makes budgeting for inclusion difficult. This paper aims to close this gap through multivariate analysis of the School Monitoring Survey 2017, supplemented by analysis of a follow-up qualitative study. The results are compared against the 2011 survey to illustrate progress in implementation. Further, the 2017 survey is compared against the Screening, Identification, Assessment and Support policy 2014 and against promising indicators of school- and teacher-level inputs and processes to identify key measurement gaps. The analysis shows substantially more schools have established school-based support teams, and more of these teams received support from the district, in 2017 than in 2011. A much larger proportion of schools has wheelchair-accessible toilets in 2017. Educators who have been trained in identifying/supporting learners experiencing learning barriers and/or have formal qualifications in special needs education are more likely to be confident in addressing learning barriers. However, many of the current training programmes do not cover curriculum or assessment differentiation. Unfortunately, less than half our schools are confident in their ability to screen learners for visual, hearing or learning difficulties. The results also suggest that educators have a poor understanding of the screening process. The poor ability to screen learners means many learners with less obvious disabilities are unlikely to be identified in schools. As a result, many learners with disabilities/experiencing barriers to learning are unlikely to receive the support they need to participate fully in learning. Inter-provincial inequalities in disability support in ordinary schools are marked. Further data is needed on the accessibility of learning materials and attitudinal barriers in ordinary schools, and the support provided by special schools. The provision of disability support must be measured alongside disability enrolment in the future to allow analysis of unmet need.

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1.   Introduction

It has been widely acknowledged that children with disabilities have been left behind in the rapid expansion of school enrolment in developing countries in recent decades. For those who begin school, the rate of Grade 6 school completion is much lower for children with disabilities than for their non-disabled peers (World Bank, 2018). In South Africa, analysis of Census (2011) and General Household Survey (2011, 2013-2015 and 2014) have shown that school enrolment is lower for children with disabilities than for their peers without disability: (Statistics South Africa, 2014) (Department of Social Development Republic of South Africa, 2015) Budlender, 2015) (Statistics South Africa, 2017) (Nuga-Deliwe, 2016). In 2015, disability was the main reported reason why 7-15 year olds were not attending school (Statistics South Africa, 2017).

Further, in South Africa, average household earnings are lower in households that include a child(ren) with a disability, compared to other households that do not, even when social grant income is included in household earnings (Department of Social Development Republic of South Africa, 2015).

Increased access to education among children with disabilities is key to reducing economic inequalities between them and their non-disabled peers later in life (Banks, Polack, & International Centre for Evidence in Disability, 2014) (Filmer, 2008). Internationally, inclusive education has been adopted as the vehicle to providing this increased access, rather than the expansion of a parallel, special school system. Improved enrolment of learners with disabilities in ordinary schools, alone, is unlikely to result in effective learning for children with disabilities (and improved future earnings potential), unless it is coupled with provision of the necessary support and improvements in the accessibility of learning environments in ordinary schools.

Similarly, monitoring enrolment of learners with disabilities in ordinary schools without also monitoring the support these learners are receiving and the accessibility of their learning environments can lead to a misleading account of the progress made in disability inclusion in schools.

Although reporting requirements to the United Nations on implementation of the Convention on the Rights of Persons with Disabilities (CRPD) and on the Sustainable Development Goals (in particular, Goal 4.5)[2] has increased pressure on government to demonstrate progress in disability inclusion in education, there has been little systematic collection of appropriate data on availability of support structures and provision of services to learners with disabilities who are enrolled in ordinary schools. A number of smaller-scale, qualitative studies, covering one or two districts, have documented cases where there is a lack of support for learners in ordinary schools or a lack of knowledge and practical skills among teachers in ordinary schools (Human Rights Watch, 2015)(Budlender, 2015; Fish Hodgson & Khumalo, 2016). While these results are very concerning, it is difficult to generalise these findings to other districts. There are only two sources of nationally representative data which address aspects of disability

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[2] "By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations."

inclusion: School Monitoring Survey (SMS) (2011, 2017) and the Teaching and Learning in Schools (TALIS) survey (2018).

The paucity of data on implementation of disability inclusion is not unique to South Africa. Two recent literature reviews have highlighted the lack of evidence on implementation of disability-inclusive education, in developing country settings. Srivastava et al. (2015) performed a literature review of inclusive education projects implemented in regular primary schools between 2000 and 2011 in developing countries and discovered only 15 projects that had been evaluated. Most of these projects were policy-level interventions, and only three were implemented in African countries (Egypt and South Africa). Loreman et al. (2014) reviewed English language academic and multilateral organisation literature on measurement or evaluation of progress of inclusive education in developing countries from 2001 to 2013. Only one study from an African country (Benin) met the inclusion criteria. As few interventions in African countries (or developing countries more generally) have been evaluated formally, it is difficult for policy-makers to identify effective and cost-effective strategies to promote disability inclusion in schools.

In South Africa, the limited evidence-base on implementation of disability inclusion in schools hinders accountability. Monitoring and research is required to determine whether ordinary schools are accessible to a range of learners with disabilities, and whether learners with disabilities are receiving disability support which can accommodate their disability and enable their participation. Previous research has suggested the resourcing of disability-inclusive education has been very uneven between provinces (Budlender, 2015) and that slow progress in policy implementation may partly be due to a lack of buy-in to the idea of inclusive education in some provinces (Du Plessis, 2013). There has been little, if any, quantitative research to investigate inequality of available disability support, geographically. Using multivariate regression analysis, this study demonstrates the inequalities in provision of disability support, by province. Sources of inequality and the implications for policy making and for economic inequality among people with disabilities are drawn out.

This study will demonstrate progress made by South Africa in two of the five aspects of disability-inclusive education covered by the CRPD: 1) do children with disabilities receive the support required, in ordinary schools, to facilitate their effective education? and 2) is reasonable accommodation[3] of their individual requirements provided in ordinary schools? This new evidence on the proportion of schools with disability support structures in place and on the remaining gaps in physical accessibility of schools will allow much more accurate budgeting for the implementation of school-level reforms.

This research explores aspects of disability inclusion in ordinary public sector schools (Grade R to Grade 12). Enrolment of learners with disabilities in ordinary schools is not addressed and will be the subject of forthcoming research. Nor will this paper address the monitoring of

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[3] Reasonable accommodation is defined as "all necessary and appropriate modifications and adjustments not imposing a disproportionate or undue burden, where needed in a particular case" to ensure that (children) with disabilities are able to enjoy or exercise their rights (to education) "on an equal basis with others" (United Nations, 2007).

achievement (grade progression, repetition, rates of school competition or drop-out) of learners with disabilities.

Part of this paper will be dedicated to presenting analysis of disability support, disability-accessibility of schools and teacher training in preparation for inclusion of learners with disabilities and/or who are experiencing barriers to learning in ordinary schools from the SMS 2017. These results will be compared with the 2011 survey, where possible, to demonstrate the extent to which disability inclusion has expanded from 2011 to 2017. The changes in survey design and questionnaire wording made in the 2017 survey will be described and critiqued, in the light of survey findings and of existing policy. The results of a qualitative study which I designed and conducted as a follow-up to the survey are used to enrich the findings of the survey. The remaining gaps in measurement will be identified. The survey data will also be used to examine the relationship between teacher training and confidence.

The next section provides additional background on the policy shift towards disability inclusion in ordinary schools in South Africa since 2000, defines the concepts of disability and barriers to learning and explains why it is so important that measurement of disability support is improved.

2.   Background

2.1   Defining disability and barriers to learning

According to the biopsychosocial model of disability, disability is the result of a "dynamic interaction between health conditions and contextual (personal and environmental) factors" (World Health Organisation, 2007). Disability arises when people with impairments face attitudinal and environmental barriers that hinder their full and effective participation in society (United Nations, 2007). Put more concretely, impairment does not necessarily lead to disability. Instead, impairments (often caused by illness or injury) can be exacerbated where the environment or system is unaccommodating, leading to disability. A range of impairments (sensory, communication, motor, learning and behavioural) can result in disability, if attitudinal and environmental barriers limit participation. Inclusive education policy, which is based on this approach to disability, focuses on individual-level interventions, on adapting the schooling environment (and broader system) to be more accommodating of a range of impairments, and on improving attitudes of educators towards disability.

South African education policy recognises disability as being among the factors that hinder participation in learning or create barriers to learning. The policy on screening, identification, assessment and support (SIAS) of 2014 defines barriers to learning as "difficulties that arise within the education system as a whole, the learning site and/or within the learner him/herself which prevent access to learning and development'". Barriers to learning are broadly defined and can arise from "social, emotional, cognitive, linguistic (factors), disability, or family … circumstances. For instance, additional support may be required for a child or young person who has learning difficulties; is being bullied; has behavioural difficulties; is a parent; has a sensory or mobility impairment; is at risk of school drop-out or has been bereaved." Learners with disabilities, specifically, are those learners for whom limited participation in learning is linked to a health condition/impairment and an unaccommodating learning environment. This

research focuses on provision of support and preparedness of teachers, in ordinary schools, for students with disabilities and the broader group of learners who are experiencing learning barriers[4].

2.2   Disability-inclusive education policy development in South Africa

This paper will assess the available indicators of disability support, disability accessibility and teacher training for inclusion of learners with disabilities in ordinary schools. Sharma et al. (2018) point out that before indicators can be developed, appropriate and unambiguous local inclusive education policies are needed.

South Africa has developed its own domestic disability-inclusive education policies. Chief among these policies are White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001) and the SIAS Policy (2008, updated in 2014)[5]. The White Paper on the Rights of Persons with Disabilities (2015) covers some aspects of schooling, in very broad terms. In addition, the Guidelines on Responding to Learner Diversity in the Classroom through the Curriculum and Assessment Policy Statement (2011) outlines approaches to accommodate diverse learning needs and capabilities within the ordinary classroom using curriculum differentiation.

In 2007, South Africa became a signatory to the UN CRPD, committing herself, among other things, to Article 24, 2(b), which states that:

> *"Persons with disabilities can access an inclusive, quality and free primary education and secondary education on an equal basis with others in the communities in which they live" (United Nations, 2007):*

In signing the CRPD, South Africa further committed to ensuring that "(children) with disabilities receive the support required, within the general education system, to facilitate their effective education" (United Nations, 2007, Article 24, 2 (d):). The CRPD further emphasises that learners with disabilities should be reasonably accommodated within the ordinary school system, where that system is not disability-accessible (Article 24, 2(c)) and that they receive the support required, within the general education system, to facilitate their effective education. Finally, state parties are bound to ensure that effective individualised support is provided in an environment that can maximise academic and social development of learners with disabilities. To achieve these goals, physical and attitudinal barriers need to be overcome in ordinary schools; teachers need to be trained and empowered to teach students with disabilities with confidence and support structures need to be put in place.

Any indicators of progress of inclusive education must flow from these domestic policies and international commitments. Unfortunately, White Paper 6 (2001) has not been converted into a bill, and is not legally binding (Watermeyer et al., 2016) (Du Plessis, 2013). It is also quite

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[4] The term "barriers to learning" is preferred in South Africa to the term "special needs" which is used internationally. The two terms are roughly equivalent (M. Nel et al., 2014).

[5] An earlier version of the SIAS policy was released in 2008 and was updated in 2014.

out of date and is currently under review. The SIAS Policy 2014, by contrast, is an updated and officially adopted education policy, which must be taken into account by decision makers. As a result, in this paper, the SIAS Policy will be used as the policy document to which possible indicators should relate.

According to the SIAS Policy 2014, school-based and district-based support teams and special schools acting as resource centres are the key support structures for inclusive education. School-based support teams (SBSTs) should be created within schools, with existing staff. Their main function is to put co-ordinated school-, learner- and teacher-support in place (Department of Basic Education, 2014a). District-based support teams are established to provide itinerant support to schools, and to support SBSTs, where needed. The district team should play a role in monitoring the support provided to learners who have been identified as having additional support needs. The policy states that this monitoring could be through school visits, class visits, mentoring and consultation. The district can also monitor expenditure on additional support measures (Department of Basic Education, 2014a). The services provided by these support structures should enable reasonable accommodation to be provided for learners with disabilities in ordinary schools.

According to policy, resource centres will be created in each district and will provide disability-equipment and additional teaching and therapy support for learners with disabilities that are accommodated at all schools in that district. This element of policy is a less clearly defined. In most districts, it is envisaged that special schools will be converted into resource centres and begin to serve learners, both in the special school and those in surrounding schools. Although it is mentioned in White Paper 6, there is no detail or clarity from policy documents on the process of shifting education therapists, counsellors, and psychologists from employment by special schools to employment at district level, where they can support special schools and learners who require their support in ordinary schools.

3.   Review of the literature

3.1   Frameworks and approaches to measuring disability support and disability inclusion in schools.

Two frameworks dominate the literature on evaluation of disability-inclusive education: the integrated model of school effectiveness and the Disability Rights in Education Model. Structurally, the models are quite similar, but the theoretical underpinnings are quite different. The integrated model of school effectiveness (sometimes referred to as the context-input-process-outputs model of schooling) grew out of earlier models of education as a production process (from the economics literature) which attempted to explain variation in educational outputs (student achievement) by examining variation in measurable inputs (particularly teacher qualifications and experience). The production function model was integrated with research from the school effectiveness literature (which seeks to understand the relationship between school characteristics and achievement, holding learner background characteristics constant); the effective schools literature (which seeks to uncover factors which explained success achieved by very effective schools), and finally, research on instructional effectiveness to create the integrated model of school effectiveness (Scheerens, 1990). Process variables as well as inputs are used to explain differences in schooling outputs, while

the broader context is acknowledged to influence effectiveness of processes in the school and classroom. Context includes the incentives created by education management at above-school level, and school characteristics, such as school size, rurality, socio-economic status of the school body and an orderly and safe school environment (Scheerens, 1990). The model is operationalised at a macro- (district or national), school- and classroom- level. Conditions at higher levels (district or national level) influence school- and classroom-level conditions (Scheerens, 1990), particularly through incentives created by policy decisions and remuneration structures. Outputs, in the school effectiveness literature are typically measured by student academic achievement. Outputs are linked to outcomes such as earnings and employment in adulthood. This framework was used to develop indicators for inclusive education for the European Union (Kyriazopoulou & Weber, 2009). It was also used to guide literature reviews of the effectiveness of disability inclusion in education. Loreman et al. (2014) and Srivastava et al. (2015) assess processes and outcomes of inclusive education at the macro, school-level, classroom-level and individual-level (teacher- , student-, or parent-level)[6].

The Disability Rights in Education Model, proposed by Peters et al. (2005), uses the same structure, but applies quite different thinking to evaluating the performance of an inclusive education system. The key innovation in the Disability Rights in Education Model is the addition of enablers to the evaluation framework. These enablers are factors that allow learners with disabilities to participate more fully in the education process in mainstream settings (Peters, Johnstone, & Ferguson, 2005). Peters et al. identify appropriate adaptation of the learning environment and appropriate accommodation of individual learner's needs to allow learners with disabilities to participate fully as the major enablers which must be present within schooling to allow effective inclusive education. By adding enablers into the model, the role of the environment in hindering or enabling participation of learners with impairments in the learning process is recognised.

Peters et al. (2005) evaluate inputs, processes, and outcomes at the international, national, and local level and emphasise that all three levels need to be aligned if disability inclusion is to be successful. This is similar to the Integrated School Effectiveness Model which emphasises the importance of incentives created by the macro-level and their influence on the local level. Both models recognise the role of context within which schooling is located.
The second difference between the two models lies in the definition of outputs and outcomes. Peters et al. define the outcomes of education much more broadly than the Integrated model of School effectiveness. They propose that education aims to produce citizenship, improve physical and mental health, impart social and behavioural skills, teach independence and produce satisfaction and all these outcomes should be evaluated in judging the success of disability inclusion (Peters et al., 2005). The Integrated model of School effectiveness focuses more narrowly on student academic achievement, using indicators such as schooling completion rates, and more recently on learning outcomes (as measured in large-scale surveys such as TIMSS or PIRLS).

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[6] The addition of parent- and student-level to the model is a little different to the Integrated model of school-effectiveness where parental input and student characteristics are seen as being part of the context.

In this paper, a hybrid of the two models is adopted as a framework for evaluating inputs and processes in inclusive education. The model is shown in Figure 1. In this paper, the focus will be on school-, classroom- and teacher-level inputs and processes. The school enablers identified by Peters et al. are critical to evaluating the implementation of disability inclusion and have been adopted. Outputs and outcomes are not discussed in this paper as the survey analysed in this research does not include information on these and cannot yet be linked to school-level achievement data. All the same, outputs are defined primarily as academic outputs (student achievement). Outcomes are defined in economic terms (as in the Integrated School Effectiveness Model), and in terms of learning outcomes. The importance of the other outputs mentioned by Peters et al. is acknowledged, but these are seen as secondary aims in education.

Context (School characteristics, Socioeconomic context)

Inputs
- School-level
- Teacher-level

Process
- School-level
- Teacher-level

Enablers
- Accessibility: physical & learning environment
- Reasonable accommodation

Outputs
- Student achievement

Outcomes
- Learning
- Employment
- Earnings
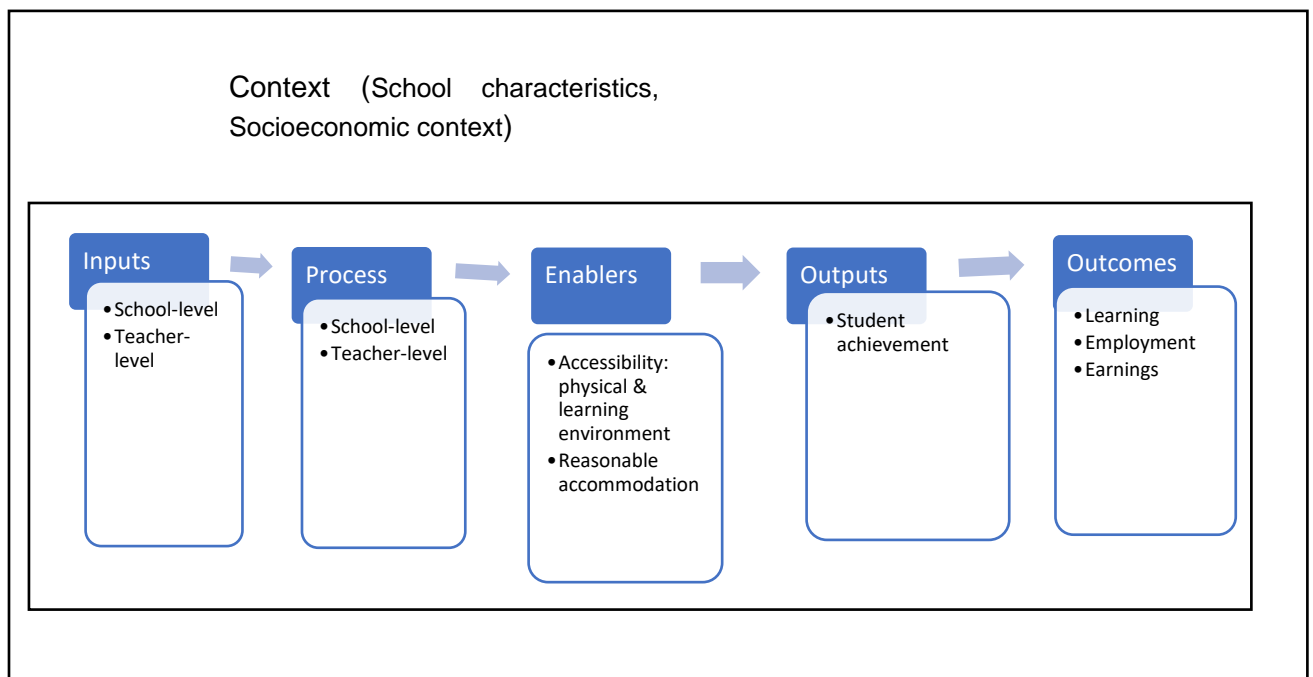
Figure 1: Integrated model of school effectiveness, including enablers of disability inclusion.

The rest of the literature review will aim to review indicators that have been used previously to measure teacher- and school-level inputs and processes, and enablers. Before discussing these, the question of transferability of indicators between contexts is addressed.

3.2 Indicators of disability inclusion in schools in low- and middle-income countries

Effective indicators need to be specific enough, measurable, relevant, attainable and must provide timeous information (Sharma, Jitoko, Macanawai, & Forlin, 2018). When adopting indicators from other countries, one needs to consider the differences in disability-inclusive

policies and the composition of the "special needs" populations targeted across countries (Watkins, Ebersold, & Lenart, 2014), the broader context, the country's developmental phase (Srivastava, de Boer, & Pijl, 2015), and the level of implementation which is possible in the current time period. It is essential that the indicators selected aligned with local policy rather than international best practice. Consequently, locally-developed indicators of progress are far more useful than internationally-developed ones (Miles, Lene, & Merumeru, 2014; Sharma et al., 2018).

Considering all these factors, three sets of international indicators of disability inclusion in schools were identified as relevant to South Africa: the Washington Group Inclusive Education Module, a UNICEF Guide to Including Disability in Educational Management Information Systems (EMIS) and the Pacific Indicators for Disability-Inclusive Education.

The Washington Group has released a draft Inclusive Education Module (Cappa, De Palma, & Loeb, 2015), focused on disability-inclusive education. The survey module has undergone extensive cognitive and field testing since 2013 in multiple developing country contexts (including India, Jamaica, Cambodia, and Kazakhstan). It focuses on four barriers to school participation: attitudes, getting to school, accessibility of the school environment and affordability of schools. A final version was not yet available at the time of writing. In a related development, also funded by UNICEF, technical guidance on including data on disability in EMIS was published in 2016. This guidance was informed by extensive research in Tanzania and included questions on teacher qualifications and school accessibility, which could be incorporated into school surveys.

The indicators developed in the Pacific Region (a group of 14 Pacific Island countries). focus narrowly on disability-inclusive education and are closely aligned with Article 24 of the United Nations CRPD. These indicators are potentially appropriate for South Africa, following a similar process of localisation, as South Africa is a signatory to the CRPD. The process of development of these indicators has been well-documented and began with developing an initial list of 126 indicators that should be measured at the system-, school-, community- or child level to satisfy reporting to United Nations conventions, regional education frameworks, national strategies, and other existing monitoring & evaluation frameworks regarding inclusive education[7]. These were reduced to 48 indicators deemed to be specific, measurable, relevant, attainable, and able to be reported timeously. The resultant indicators address access, quality and effectiveness and are arranged in ten dimensions (policy and legislation, awareness, teacher training, presence & achievement, physical environment & transport, identification, early intervention & services, collaboration & shared responsibility, curriculum & assessment practices, transition pathways) (Sharma et al., 2018). Core school-level indicators were chosen within these dimensions and are shown in Appendix Table 1. Member countries have selected indicators for testing and validation in their contexts.

Promising teacher- and school-level input and process indicators from these sources and others are presented in more detail below.

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[7] This exercise began before the Sustainable Development Goals were developed.

3.2.1 Teacher-level inputs

Teacher-level inputs may include teacher attitudes, knowledge, and skills, available instruction time, teaching methods and available teaching resources. Internationally, evaluations have often focused on the levels of teacher preparedness for including learners with disabilities or special educational needs in an ordinary classroom. In high income countries, there is evidence that specialised teacher training is linked to improved knowledge and skill in the area of inclusion and disability (Copfer & Specht, 2014) and higher confidence in implementing inclusion and more positive attitudes to students with special education needs or disabilities (McGhie-Richmond, Irvine, Loreman, Cizman, & Lupart, 2013). Given this evidence on the link between knowledge, skill and specialised training, some research simply evaluates presence of specialised teacher training, rather than measuring teacher attitudes. For example, Watkins et al. identify teacher education and training of other education professionals (relating to inclusion) as a key areas of impact which should be addressed when assessing the implementation of inclusive education (Watkins et al., 2014). Data on teacher training for inclusion should be collected in EMIS in LMICs, according to recent guidelines (UNICEF Education Section, 2016).

Another body of research advocates directly measuring teachers' attitudes to inclusive education and beliefs around disability, and their knowledge, skill, and self-efficacy in implementing inclusive education. A number of scales have been developed and validated in high income countries to evaluate teachers attitudes towards inclusion, beliefs about disability and self-efficacy in inclusive education (Copfer & Specht, 2014) and teachers self-rated ability in teaching to accommodate diversity (Chan, 2008). Unfortunately, few of these scales have been used in LMIC contexts.

In South Africa, there are two large sample, nationally-representative school surveys which provide indicators of disability-accessibility and teacher preparedness for including learners with disabilities in ordinary classrooms, as part of broader surveys. One of thirteen school quality indicators measured in the School Monitoring Surveys (SMS) (conducted in 2011 and 2017) is the percentage of schools that have at least one educator who has received formal or informal training in identifying and supporting learners with special education needs (in the 2011 survey) or learners experiencing barriers to learning (in the 2017 survey). The SMS also evaluates some school-level inputs, the school's ability to screen learners and a few aspects of physical accessibility.

In 2018, the large-scale international Teaching and Learning in Schools (TALIS) survey was conducted in a nationally-representative survey of 2,046 lower secondary teachers and 169 Principals from 200 schools in South Africa (Le Donne & Schwabe, 2019). Among other things, it evaluated teacher training for inclusion of learners with special needs and teaching in mixed ability settings.

In South Africa, several qualitative studies have assessed teachers attitudes towards the idea of inclusion, or educators' perceptions of barriers to inclusion. However, the studies have not linked these attitudes to levels of prior training in inclusive education directly, and the results tend to be difficult to generalise. The SMS focuses on measuring whether teachers have received training in special needs or learning barriers and measures teacher confidence in this area. It does not attempt to measure attitudes to inclusion or towards learners with

disabilities. TALIS 2018 measures the receipt of training in teaching students with special needs, teachers' perceptions of their need for training in this area and Principals' opinions of the number of teachers who are competent to teach learners with special needs and the impact of this on quality of instruction.

The SMS does not address the extent to which inclusive education was addressed in initial teacher education or the extent to which it prepares teachers to include learners with disabilities or to address learning barriers in ordinary classrooms. Fortunately, TALIS 2018 fills this gap in secondary schools, collecting data on whether teachers felt prepared to teach in mixed ability settings, following pre-service training, and whether they feel the need for further training to teach learners with special needs. No quantitative surveys could be found which evaluate these factors among primary school teachers.

3.2.2 School-level inputs

Evaluations of inclusive education projects in developed countries have assessed the structures for providing special services in schools, the role of special schools, and collaboration between schools, and between schools and the support system (Srivastava et al., 2015). Research from Europe suggests that the existence of support structures is a rough proxy for the accessibility of the learning environment (Watkins et al., 2014). In South Africa, the key support structures are School-based support teams (SBSTs), district-based support teams and special schools acting as resource centres to other schools in their circuit or district.

3.2.3 Process indicators

School- and teacher-level processes are difficult to separate and have been combined in this paper. Scheerens (1990) emphasises that process indicators are only valuable if they can be shown to influence outputs, or at least have a clear hypothetical role in determining outputs. In South Africa, we have little information on achievement of learners with disabilities, as compared to their peers. Thus, any proposed process indicators must have a clear hypothetical link to outputs. Process indicators are often much more difficult to measure than educational inputs and suitable proxy measures are often needed (Scheerens, 1990).

The processes identified as the most relevant to the inclusion of learners with disabilities in ordinary schools are screening of learners, and collaboration among educators. In South Africa, the school-level processes for screening and identification of learners who are experiencing learning barriers and possible disabilities have been defined in the 2014 SIAS Policy. This policy also outlines processes to be followed in formal assessment and to obtain additional support from the district.

The 2011 SMS assessed schools' ability to screen (and identify) learners with special education needs. These questions suffered much higher levels of missing data than other questions. It has been suggested that the question wording ("Has your school, without the help of the district, been able to screen learners for special education needs?") and in particular the phrase "without the help of the district" may have led to confusion (Department of Basic Education, 2014b). This phrase was subsequently dropped in 2017. A further anomaly

emerged: substantially more schools (58%) reported being able to identify at least "some learners with special needs" than reported being able to screen "at least some learners for special needs" (47% of schools). While it is possible that some learners could enroll in a school with a special need already identified, the discrepancy between the percentage of schools reporting successful screening and successful identification seems too large to be explained by this factor alone. These responses more likely illustrate a poor understanding of the concept of screening among Principals or confusion over whose responsibility it is to screen (the school, the district, or the Integrated School Health Programme). Health screening is conducted in schools as part of the Integrated School Health Programme. These screening activities include screening of vision and hearing (Bamford, 2019) and the identification of chronic health conditions, which could lead to disability if unaddressed (Samuels, Stemela, & Booi, 2020). Grade 1 screening coverage is the best available indicator of early screening of vision and hearing. Screening for learning difficulties is the joint responsibility of the school, and district.

Rather than measuring perceptions of the ability to screen, the Pacific Region indicators focus on the outcomes of early identification and support services, by measuring the number of children with disabilities who are provided with relevant assistive devices and technologies. In South Africa, use of assistive devices (eyeglasses, hearing aids, wheelchairs and walking sticks/frames) is measured in Census. Utilisation of eyeglasses has been shown to be much lower in the black African and coloured children of school-going age than among their white or Indian counterparts. Further, a rapid increase in utilisation around the ages of 7-8 years is apparent among white and Indian children, but not among black African and coloured children. Gustafsson (2017) concludes that neither home background nor the classroom environment supports the identification of visual difficulties in schools attended by most black African and coloured learners. Access to acquiring eyeglasses, once visual difficulties are identified, may also be poor in these communities.

Collaboration is seen as a key to effective inclusive teaching practice, as it assists teachers to overcome their fears about inclusion (Forlin, 2008). A lack of collaboration between teachers in ordinary and special schools has been shown to be a barrier to implementing inclusion (Montgomery & Mirenda, 2014) and collaboration between teachers and parents has been key to the success of inclusion in the United Kingdom (MacBeaton et al, 2006). Collaboration is one of the ten domains of the Pacific Indicators for Disability-Inclusive Education. One of the core indicator measures whether formal processes have been established in a school to systematically involve parents of children with disabilities in educational programmes (Sharma et al., 2018). In South Africa, there is a formal process in place (the SIAS process) and it rests on effective collaboration and communication between teachers and parents; between SBST members, and between teachers and outside professionals. Collaboration between these role-players has been evaluated in qualitative research in South Africa.

3.2.4   School-level enablers

A review of the literature suggests that physical accessibility of the school environment and learning material accessibility are the most critical school-level enablers of inclusion in the South African context.

Physical accessibility of schools enables participation of learners with physical disabilities or learners who are blind or partially sighted. A recent review suggests that questions on how many classrooms or floors of the school are accessible to students with disabilities should be included in school surveys(UNICEF Education Section, 2016). In a review of Education Management Information Systems (EMIS) in LMICs, seven out of 40 information systems collected information on the roads to the school (the distance of the nearest road to the school and whether it was passable in the rainy season) (Mont, 2014) but very few collected other information on physical accessibility of schools. UNICEF recommends that, as a minimum, EMIS should monitor the accessibility of the main entrance to the school and accessible toilets. Access into the school should address the accessibility of the road leading to the school[8]*;* presence of stairs or ramps into the main entrance of the school, and whether the main entrance of the school is wide enough for a person in a wheelchair to enter (UNICEF Education Section, 2016). Qualitative research in South African among caregivers of children with disabilities illustrates that incontinence, the need for assistance during toileting or inaccessible or inappropriate toilet facilities are a key reason why children with severe intellectual, physical or psychosocial disabilities are not enrolled in mainstream schools (Department of Social Development Republic of South Africa, 2015). This suggests that monitoring the availability of wheelchair-accessible toilets is critically important. A recent study to inform the Inclusive Education Strategy for the Southern Africa Development Community made recommendations on the data to be collected in EMIS on the accessibility of schools for learners with disabilities. Their advice is strongly informed by UNICEF's technical guidance (MiET Africa, 2015).

Learning material accessibility[9] can be as important as physical accessibility. The availability of items such as braille books, audio books, modified furniture, handrails and large, easy to read signage should be measured (Mont, 2014). Research in the European Union has suggested measuring the provision of reasonable accommodation and existence of support structures as a rough proxy for learning accessibility (Watkins et al., 2014). Reasonable accommodations (appropriate modifications and adjustments in schools and classrooms) differ according to domains of disability (for example: sensory, mobility, intellectual) and according to the specific needs of individual learners. As a result, it is difficult for a large sample survey to measure whether learners are receiving appropriate reasonable accommodation of their disability. In a nationally-representative survey such as this one, measuring the availability of disability support structures is more appropriate. The provision of reasonable accommodation can, however, be collected as part of a learner-level EMIS. For example, the Pacific Region has opted to monitor the number of children with disabilities who sit exams with reasonable accommodations[10].

Watkins et al. (2014) identify the number of learners with individual education plans (IEPs[11]) and perceived quality of these IEPs as two possible indicators. However, other researchers argue that IEPs should not be necessary if curricula are flexible and well-designed to

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[8] "Is the road leading to the school accessible to a student in a wheelchair, including during the rainy season?"

[9] use of furniture, equipment, learning materials and communication supports to enable effective learning among children with disabilities (UNICEF Education Section, 2016).

[10] These are known as concessions in South Africa, and may include a scribe for examinations, a braille examination paper, a spelling exemption, or extra time, among other things.

[11] or individual support plan, as they are known in South Africa.

accommodate a diversity of learners (Loreman, Forlin, & Sharma, 2014). These researchers argue that the development of IEPs is resource-intensive and that a high number of learners with IEPs is a sign of failure of the system to provide a curriculum that is universally accessible.

3.3 Existing evidence of disability inclusion in South African schools

In this section the existing evidence on disability support, disability accessibility and teacher training for inclusion in South Africa is presented, organised in the same categories as above. This provides a backdrop against which the evidence from the SMS 2017 will be presented.

3.3.1 Teacher-level inputs

According to SMS 2011, there was at least one teacher that had received some specialised training in the identification and support of special needs in 71% of schools (Department of Basic Education, 2014b). Specialised training could take the form of a tertiary degree, post-matriculation diploma, post-graduate diploma or Advanced Certificate in Education or an accredited short course in special or remedial education. Similarly, 70% of schools had at least one educator who had received informal training on identifying learners with special needs. (Department of Basic Education, 2013a). There were provincial differences in the percentage of schools with at least one trained educator, with Limpopo, Eastern Cape, Mpumalanga, and the Northern Cape below the national average (significance levels not reported). The high levels of training in Free State schools in 2011 is highlighted in the SMS 2011 technical report (Department of Basic Education, 2014b). The percentage of schools with at least one trained educator increased from quintile 1 through to quintile 5 schools, but statistical significance of these differences is not reported (Department of Basic Education, 2013a). On average, training was applied more frequently by teachers in Gauteng and least frequently in the Northern Cape. However, no multivariate regression analysis has been conducted on the 2011 data, to assess the associations between province, quintile, phase taught, school designation or other school characteristics with the level of training.

SMS 2011 measured teacher confidence in "dealing with learners with special education needs". In 2011, 21% of teachers were "not confident"; 54% were "somewhat confident" and 25% were "very confident" in dealing with learners with special education needs[12]. Analysis based on SMS 2011 concluded that educators who had received both formal qualifications and informal training were more confident than those who had received informal training only (Department of Basic Education, 2014b). However, these results should be treated with caution as there were high levels of missing data in this question (23%), due to interviewee errors in following skip patterns. The probability of missing data was much higher among teachers who did not receive informal training (31%) than among those who received informal training (2%). This pattern in the missing data means that the data is no longer representative of all educators surveyed, and may bias the results on teacher confidence upwards, overall[13]. This is worrying considering the already low levels of confidence reported. As a result, data from 2011 SMS does not reliably illustrate the link between training and teacher confidence.

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[12] Oddly, no educators selected the category "confident", which suggests possible data problems.
[13] As those teachers who had received training are more likely to be confident and also more likely to have answered the question.

In TALIS 2018 34% of teachers surveyed reported they had participated in training that included teaching special needs students in the past 12 months. Despite these fairly high levels of training, 39% of teachers in South Africa reported a high need for training in teaching special needs. This was significantly higher than in other countries surveyed, on average (22%). Further, 53% of Principals reported that quality instruction was compromised by the low number of teachers who were competent in teaching students with special needs in South Africa. Overall, these results suggest that the current training in this area is inadequate to prepare educators to teach learners with special educational needs in a diverse, inclusive classroom. By contrast, a significantly higher proportion of South African teachers (81%) felt able to cope with the challenges of teaching in multicultural or multilingual settings than in other countries surveyed, on average (67%) (OECD, 2019).

Other research has identified initial teacher education which does not prepare teachers for including learners with disabilities (Engelbrecht et al., 2016) and negative attitudes to learners with disabilities among teachers and principals as obstacles to creating effective learning environments for learners with disabilities in ordinary schools.

3.3.2 School-level inputs

According to SMS 2011, only 54% of schools had a school-based support team, and these were more common in larger schools (which tend to be in urban areas). (Department of Basic Education, 2014b). Coverage of SBSTs was much higher in the urban provinces (Gauteng and the Western Cape) but was also higher (72% of schools) in the Free State and Mpumalanga. There was particularly poor SBST coverage in Limpopo (14% of schools). Coverage of SBST in quintile 1 and 2 schools (41% and 43% respectively) was lower than in schools from wealthier quintiles. As quintile 1 and 2 schools tend to be in rural areas, this suggests poor penetration of SBSTs in schools in rural areas.

Evaluating the presence of SBSTs does not provide any information on their functionality. According to qualitative research in schools in southern Gauteng and the northern Free State, most educators who mentioned SBSTs in semi-structured interviews described that these often did not function well, or existed only "on paper" (M. Nel, Engelbrecht, Nel, & Tlale, 2014). By contrast, a more recent study in a different district in Gauteng suggested SBSTs were generally functioning well (N. M. Nel, Tlale, Engelbrecht, & Nel, 2016).

Districts provide important support to SBSTs. In 2011, support was provided to the SBST during 34% of the district support visits to schools. District officials were far more likely to provide support to the Principal (64% of visits), school management team (51% of visits), school assessment team (43%), health and safety team (43%), School Governing Body (41%) or learners (39% of visits) than to SBSTs.

National government acknowledged major disparities by province in the number of functional district-based support teams in 2014 but has not since released updated information on the number of posts filled in these teams or the number of teams established per province. Support structures must be adequately staffed (with therapists and other professionals) to provide support to learners in ordinary schools (Roach & Elliot, 2009). Anecdotal evidence suggests there are high levels of vacancies in district-based teams in some provinces.

In the 2011 SMS, very few Principals answered the question on satisfaction with support provided by district and this question was dropped from the 2017 SMS. Qualitative research suggests that, in some districts, the district is fulfilling its mandate and teachers have an established professional relationship with the district-based support team (N. M. Nel et al., 2016), while in other districts a functioning team does not exist (Fish Hodgson & Khumalo, 2016). The evidence suggests that, by 2014, functionality of district-based support teams varied tremendously between districts.

3.3.3   Process indicators

By 2016 all foundation phase teachers and SBST members in 5,000 to 10,000 schools should have been trained in the implementation of the SIAS Policy, which involves screening and identifying learners for learning barriers (Department of Basic Education, 2014a). Given the rollout of this training, one would expect to find improved teacher understanding of screening in the 2017 SMS.

Data from the District Health Information System shows wide inter-provincial variation in School Health screening coverage by the Integrated School Health Programme. Screening covered only 33% of Grade 1 learners, nationally, in 2017 and was lower still in the Northern and Eastern Cape, KwaZulu-Natal, Mpumalanga and the Free State (as shown in Table 12). Even more worrying are the low and highly variable provincial targets for Grade 1 screening. Targets range from 16% of Grade 1 learners in the Northern Cape to 61% in the Free State (Bamford, 2019).

TIMSS 2015 addressed the question of general teacher collaboration to improve teaching and learning in a representative sample of 300 ordinary schools in South Africa. Grade 5 and 9 maths and science teachers were asked how frequently they interacted with other teachers at their school in five areas. The results suggest that teachers collaborate most frequently to discuss "how to teach a particular topic" (35% of learners are taught by teachers who *very often* collaborate in this way*) and "*working as a group to implement the curriculum" (32%). Teachers are less likely to "work together to try out new ideas" (21% of learners are taught by teachers who "very often" collaborate in this way) or work "with teachers from other grades to ensure continuity" (23% of learners). "Working with teachers from other grades to ensure continuity" is uniformly low across no-fee, fee-charging and independent schools. The TIMSS report concludes that teachers are willing to collaborate, but do not necessarily collaborate in structured ways (Zuze, Reddy, Visser, Winnaar, & Govender, 2017).

There is far less evidence on collaboration within inclusive education. One qualitative study among 108 teachers completing post-graduate qualifications in inclusive education or learner support in four South African universities has addressed this question. While the authors warn that the findings may not be generalisable due to the small, purposive sample (M. Nel et al., 2014), the results are not encouraging. Collaboration with parents was seen to be a vital strategy, but educators generally had a poor understanding of the concept of collaboration and of their role in collaborating with professionals, such as therapists and psychologists. 87% of the educators in the study believed that their role was to refer learners to experts, or to consult experts rather than to play an active role in collaboration. Only 12% of educators emphasised teamwork to enable effective learning for a learner experiencing some barrier to

learning (M. Nel et al., 2014). Teachers lacked confidence to take an equal role in these collaborations. The lack of opportunities to collaborate may also be key in undermining teachers' perceptions of how these collaborations should work. These findings are echoed in a similar qualitative study in other districts, which concludes that formal support to teachers may still be focused on identification and referral to special schools and specialists, rather than on providing teachers with the knowledge and skill to support learning in their own schools (N. M. Nel et al., 2016). The authors attribute this, in large part, to initial teacher training which does not adopt an inclusive education approach, nor includes training in collaborative approaches. The lack of training in collaborative skills in initial teacher training, in the context of inclusive education practice, has been highlighted in other settings too (Lancaster, 2014)

3.3.4   School-level enablers

SMS 2011 shows that 16% of schools had at least one toilet adapted for people with disabilities. Rates of access were highest in the Northern Cape (29% of schools) and lowest in Limpopo. Unfortunately, there were high levels of missing data on questions on the presence of disability-accessible toilets, which makes the 2011 results difficult to interpret. Understanding the accessibility of sanitation in the broader context is important. The SMS 2011 shows 25% of schools do not have separate, suitable toilets for boys and girls (Department of Basic Education, 2013b). These schools were concentrated in the Eastern Cape, Free State, KwaZulu-Natal and the North West (Department of Basic Education, 2014b). The lack of paved access between the school gate and buildings, and between classrooms and ablution blocks is another potential source of physical inaccessibility in South African schools (Department of Social Development, Republic of South Africa, Department of Women, Children and People with Disabilities, & UNICEF, 2012).

Having reviewed the available evidence, the SMS 2017 dataset and the methods of data analysis will be discussed in more detail. Following this, the results of the survey are presented, according to the categories used in this section.

4.   Data and methods

SMS 2017 was conducted in October and November 2017. A research team spent two days in each school, completing multiple structured survey instruments and interviews with a range of educators on a date agreed with the Principal ahead of time (Nexia SAB & T, 2017). A trained fieldworker completed a structured school observation, which assessed infrastructure. Data from three of the survey instruments (the school observation, Principal interview and the stand-alone "learners with special educational needs" educator questionnaire) was used in this study.

Follow-up qualitative research occurred in a small sample of schools in Limpopo, the Free State and the Western Cape in March and April 2018. The qualitative interviews were conducted by the author, telephonically, with the educator who had completed a stand-alone questionnaire addressing aspects of special needs education in late 2017 (this will be referred to henceforth as the educator questionnaire). The qualitative research evaluated respondents' understanding of questionnaire wording and of certain concepts pertaining to inclusive

education. In particular, understanding of the term "learners with learning barriers" was interrogated. A discussion guide was used to guide the interview, which took approximately 20 minutes.

Permission was obtained from the Department of Basic Education to use SMS 2011 and 2017 data, to evaluate the questionnaire design regarding measurement of disability accessibility and support and to conduct further qualitative research assessing ease of use of the 2017 educator questionnaire. Informed consent was obtained telephonically from school principals and in writing from participants, prior to participation in the qualitative research. Permission was granted by the Stellenbosch University Humanities Research Ethics Committee (ECO-2018-1533).

4.1   Description of 2017 School Monitoring Survey sample

SMS 2017 was conducted on a random sample of public sector primary and secondary schools in all nine provinces, with sample stratification by province and quintile within province. The number of schools recruited into the sample was approximately equal across provinces (Nexia SAB&T, 2017). As the total number of schools varies substantially by province, variables must be weighted to adjust for the uneven probability that a school is selected in the sample. The further stratification by quintile within provincial samples was done to ensure that each provincial sample is representative of the quintile ratios within that province. The planned sample was 2,000 schools (1,000 primary and 1,000 secondary schools). The rates of refusal were low, and similar across the three instruments (Nexia SAB & T, 2017), as shown in Appendix Table 2.

The low proportion of SBST Coordinators responding to the educator questionnaire is disappointing as they are likely to be best placed to answer these questions. This trend also suggests that many SBSTs are inactive. As shown in Table 1, over 50% of respondents to the educator questionnaire identified themselves as LSEN educators. It is, however, possible that "LSEN educator" may have been selected by all those educators who were not SBST Coordinators, or part of the senior management team, as no allowance was made for "other" respondent type.

Table 1: Sample description: School Monitoring Survey, 2017 (unweighted)

	Grade 6 sample N=989	Grade 12 sample N=992	Total N=1981
Province in which school is located			
Western Cape	111 (11.2%)	111 (11.2%)	222 (11.2%)
Eastern Cape	114 (11.5%)	114 (11.5%)	228 (11.5%)
Northern Cape	100 (10.1%)	100 (10.1%)	200 (10.1%)
Free State	106 (10.7%)	107 (10.8%)	213 (10.8%)
KwaZulu-Natal	119 (12.0%)	116 (11.7%)	235 (11.9%)
North West	108 (10.9%)	107 (10.8%)	215 (10.9%)
Gauteng	107 (10.8%)	112 (11.3%)	219 (11.1%)
Mpumalanga	110 (11.1%)	110 (11.1%)	220 (11.1%)
Limpopo	114 (11.5%)	115 (11.6%)	229 (11.6%)
School wealth quintile			
Quintile 1	266 (26.9%)	229 (23.1%)	495 (25.0%)
Quintile 2	249 (25.2%)	217 (21.9%)	466 (23.5%)
Quintile 3	246 (24.9%)	256 (25.8%)	502 (25.3%)
Quintile 4	108 (10.9%)	132 (13.3%)	240 (12.1%)
Quintile 5	120 (12.1%)	158 (15.9%)	278 (14.0%)
School size (number of learners)			
< 600 learners	388 (39.9%)	256 (26.4%)	644 (33.2%)
>=600 learners	584 (60.1%)	713 (73.6%)	1297 (66.8%)
Person interviewed (educator questionnaire)			
LSEN Educator	495 (50.5%)	443 (45.0%)	938 (47.7%)
Deputy Principal	89 (9.1%)	143 (14.5%)	232 (11.8%)
Principal	180 (18.3%)	201 (20.4%)	381 (19.4%)
SBST Coordinator	217 (22.1%)	198 (20.1%)	415 (21.1%)

4.2   Description of qualitative study sample

Eighteen of the schools that participated in SMS in 2017 in the Free State, Limpopo and Western Cape were purposively selected to participate in further qualitative research in 2018. The sample was designed such that one primary and one high school was selected from a high-functioning, a low-functioning, and a moderately-functioning district in each province. The purposive sample design further aimed to achieve a balance between rural and urban schools, and by quintile. Interviews were completed in 72% of the planned sample (13 of 18 schools). The response rate in the qualitative survey was lower than in the overall survey as the interviews were conducted telephonically. It proved impossible to contact the correct person by telephone in three schools, and participants refused to participate in two schools. The refusals are likely due to interviewee fatigue as there were several interviews conducted as part of the broader qualitative study. The achieved qualitative sample is skewed towards quintile 1 to 3 schools, and towards primary schools, as shown in Table 2. The Western Cape is under-represented in the final sample.

Table 2: Characteristics of final qualitative sample.

School characteristic		% of sample	n
Province	Free State	46	6
	Limpopo	31	4
	Western Cape	23	3
Quintile	Quintile 1	31	4
	Quintile 2	23	3
	Quintile 3	31	4
	Quintile 4	0	0
	Quintile 5	15	2
Phase	Primary schools	62	8
	Secondary Schools	23	3
Designation (provincially-reported)	Full-service school	15	2
Role of interviewee	LSEN Educator	46	6
	Principal	31	4
	Deputy Principal	0	0
	SBST Coordinator	23	3
Sample		100	13

Source: own analysis of achieved sample: qualitative study

4.3 Improvements in survey design and measurement from 2011 to 2017

There are very low levels of missing data in SMS 2017 due to the use of computer-assisted personal interviewing, where interviewers directly captured data onto tablets, using DROIDSurvey. The adoption of this technology also removed the possibility of interviewee/er error with questionnaire skip patterns, such as those that led to a biased sample of teachers completing the question on teacher confidence data in 2011 (discussed in Section 3.3).

The questions in the SMS 2011 that pertained to learners with special needs were reviewed and several changes to wording and additional questions were suggested. The terminology used in the 2017 questionnaires was amended to bring it more closely in line with policy (specifically, the term "learning barriers" was used instead of "special needs"[14]). These questions were piloted and some of the questions were incorporated in the final questionnaires. In developing an expanded set of disability-accessibility questions, two questions from the Guide for Including Disability in Education Management Information Systems (UNICEF Education Section, 2016) were used, with permission from the authors. The number of new questions was limited by the length of the questionnaires, the wide scope of the survey (it assesses 13 objectives) and the need to maintain comparability between the 2011 and 2017 surveys.

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[14] This is discussed in more detail in section 5.1.

In 2011, questions on training on special needs and the support that educators have received from the district structures were included in the educator questionnaire. This questionnaire was self-completed by educators. While the study required up to ten educators per school to be selected to complete this questionnaire in 2011, the achieved sample ranged from one to ten educators per school (Department of Basic Education, 2013b). In schools with more than ten educators, respondents were selected by the Principal (with the instruction that at least one of the selected educators must have some special needs training)(Department of Basic Education, 2013b). Although the Principal was instructed to select participants randomly, it is likely that there may have been some bias towards educators who would report favourably on the schools' performance. In 2017, questions on learners who are experiencing learning barriers were included in a stand-alone questionnaire (hereafter known as the educator questionnaire), which was administered to one educator per school. This simplification led to increased comparability between schools, simplified the calculation of school and learner weights and reduced possible selection bias.

4.4   Data quality, cleaning, and verification in School Monitoring Survey 2017

Several studies of school survey data have illustrated that response styles (systematic patterns in individual's responses, regardless of question content) might contaminate the data (Blasius & Thiessen, 2015; Colasante et al., 2019; Feuerborn, Tyre, & Zečević, 2019; He & Van De Vijver, 2015). Response styles include an acquiescent response style (the tendency to agree with questions in a survey, regardless of the content of the question), extreme response styles (a tendency to choose extremes in a response scale), midpoint response style (consistent choice of the midpoint on a response scale) and socially desirable reporting (the tendency of respondents to provide responses which they believe will be viewed favourably by others). Socially desirable reporting has been shown to be present in previous research with principals and teachers in South Africa (Taylor, Wills, & Hoadley, 2019). Taylor et al. uncovered evidence of socially desirable reporting in teacher surveys, by triangulating survey data with probing qualitative interviews and by asking the same survey question of multiple respondents, to evaluate agreement. In-depth interviews were used to "penetrate the façade of socially acceptable responses". This study follows a similar approach to determine if socially desirable reporting is present in the survey responses. In the SMS 2017, triangulation of data was achieved by asking the same question of more than one role-player in a school, or by repeating similar questions in a single instrument, or through verification of self-reported responses with more objective observation of facilities by fieldworkers. Results of the qualitative study were used as a broader verification of the findings of the educator questionnaire. Appendix Table 3 illustrates the data that could be triangulated from repeated questions (in the same instrument or in another survey instrument) or by comparison with data in the school observation. Responses to open-ended questions were used to verify responses to the preceding questions. Where triangulation has been performed, it is reported in the results.

There were improbably high levels of agreement (53%) with the question "Is this a full-service school?". This data was verified against 2017 official data on full-service designation. The comparison showed a 51% false positive rate (schools that incorrectly claimed they were full-service schools). The suggests that, when faced with uncertainty, educators tend to agree with

statements, or provide what they view as socially desirable response. The same pattern was detected with regard to wheelchair-accessible toilets where self-reported exceeded observed results substantially (discussed in section 5.4) and where 15% of respondents who claimed their school was able to screen for learning barriers conceded that they had not done any screening when probed for details (discussed in section 5.3). In these two questions either socially desirable reporting (or possibly acquiescence bias) appears to be playing a role. It is possible that the other results presented below may also be influenced by over-reporting.

In three questions substantial over-reporting was detected using triangulation techniques. These questions pertain to wheelchair-accessible toilets, full-service designation of the school and ability to screen for learning difficulties. There were improbably high levels of agreement (53%) with the question "Is this a full-service school?". The self-reported data was verified against 2017 official data on full-service designation. The comparison showed a 51% false positive rate (schools that incorrectly claimed they were full-service schools) and 17% false negative rate (schools that incorrectly claimed they were not full-service schools). The high levels of incorrect reporting to this question suggest that full-service designation is not well understood or widely known. But the high false positive rate suggests that; when faced with uncertainty, educators tend to agree with statements, or provide what they view as socially desirable response. Triangulation detected inconsistencies in reporting between self-reported and observed wheelchair-accessible toilets (discussed in section 5.4). Analysis of open-ended questions shows that 15% of respondents who claimed their school was able to screen for learning barriers conceded that they had not done any screening when probed for details (discussed in section 5.3). In these questions either socially desirable reporting (or possibly acquiescence bias) appears to be playing a role.

Response styles (other than socially desirable reporting) lead to patterns in responses, which can be detected with statistical techniques, such as principal component analysis or factor analysis. However, several response styles manifest in similar patterns and the results of techniques do not always converge (He & Van De Vijver, 2015). The small number of questions in the educator questionnaire made it difficult to apply any of these techniques. As a result, no formal testing for other response patterns was possible. Instead, careful attention was paid to the possible presence of socially desirable reporting.

The findings of SMS 2017 were compared against the 2011 survey to ascertain progress in implementation and as a further check on data quality, where the question wording was similar across years. The results on screening ability were compared with the rates of screening coverage in Grade 1 and 8 from the District Health Information System, as published in the District Health Barometer 2017/18. Where there were geographic differences in coverage of services, these were further compared against the disability prevalence rates calculated from the Community Survey 2016 data. These rates were estimated at a provincial level for children aged 7 to 18 years whose caregivers reported they were enrolled in an educational institution. Disability status of a child was defined as per the disability status index (used by Statistics South Africa). Children were classified as having a disability if the child had a lot of difficulty or was completely unable to perform one (or more) disability domain(s), or if the child had some difficulty in performing two or more disability domains (Statistics South Africa, 2014).

4.5   Approach to analysis

Data from the school observation, Principal interview and the educator questionnaire were merged with data on school characteristics from the Master List of Schools 2016. Analysis was conducted at the school-level, using school weights. School weights account for the uneven probability that a school is selected into the sample, between provinces[15]. Weighted regression analysis leads to unbiased estimators. All analysis was done in Stata version 14, using the *svy* commands to take account of stratification in sampling and possible heteroskedasticity.

The analysis was repeated at the learner level (weighted by learner weights), but no substantially different results were found. Learner level analysis of screening indicators is, however, reported as it is more intuitive to interpret and compare with school health indicators from the District Health Information System.

Multivariate regression analysis is used to explain variation in educator training by observable school characteristics, and to examine the relationship between educator training and confidence in dealing with learners experiencing learning barriers. It is also used to variation in school-based support team coverage, and provision of district support to SBSTs by school characteristics. Finally, schools' ability to screen learners and complete SIAS processes is assessed relative to school characteristics, training, and presence of SBSTs. These results present a much more nuanced view of these relationships than univariate analysis, which looks at variation by either quintile or province, individually. To my knowledge this is the first study that applies multivariate techniques to this type of data in South Africa. Both descriptive (univariate) and multivariate analysis was conducted on the combined sample (primary and secondary schools).

For the educator questionnaire, the selection of the respondent was at the Principal's discretion (either the Principal him/herself, the Deputy Principal, the SBST Coordinator or an "LSEN[16] educator"). Principals were asked to select the person best qualified in special or remedial education or supporting learners who were experiencing learning barriers. Allowing the Principal to choose the respondent for the questionnaire has introduced some selection bias in the results. One of the results of this selection bias is that one cannot apply the findings of the educator questionnaire to the whole population of Principals, Deputy Principals, SBST Coordinators or LSEN educators. Appendix Table 4 shows that while 62% of principals who answered the educator questionnaire were trained in identifying or supporting learners who are experiencing learning barriers, only 48% of principals overall had received such training. This suggests that principals who self-selected to answer the educator questionnaire were significantly more likely to have received training in this area (and hence nominated themselves to complete the questionnaire).

More fundamentally, schools where the Principal is the most qualified educator in addressing learning barriers/ special needs (or nominates himself/herself to answer the questionnaire for

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[15] When analysis is done at the learner-level, a learner weight is needed to account for uneven probabilities that a learner is recruited into the sample, by province and size of the school.
[16] LSEN educator stands for Learners with Special Education Needs educator. In other countries this might be termed a Special Needs Educator or Remedial Educator.

other reasons unrelated to training) are likely to differ, in many measurable and unmeasurable ways, from schools where another educator is better qualified (or is nominated to complete the questionnaire). For this reason, regression analysis was run for the total sample and also separately for two sub-samples: a) those schools where the Principal was the respondent and b) those where another educator was the respondent. This is particularly important as the proportion of schools in which the Principal answered the questionnaire varies with province (see Appendix Table 5).

This paper reports on analysis of the whole sample. In a forthcoming publication, ordinary and full-service schools in the sample are analysed separately and results for each group of schools are compared to determine whether full-service schools are better equipped and prepared for disability inclusion than ordinary schools.

4.6 Estimation framework: multivariate analysis

Several dependent variables of interest in this study are binary (taking the value of 1 or 0 depending on the occurrence or non-occurrence of an event). For example: Does a school have at least one educator trained in identifying and supporting learners experiencing learning barriers? Has the respondent received training in curriculum differentiation? Does the school have a SBST in place? Did the school receive district support for SBST? Where the dependent variable is binary, there are several estimation techniques for multivariate regression that are appropriate: a linear probability model (LPM), logistic regression or probit models. Both logistic regression and probit models rely on maximum likelihood estimation, which is a large sample technique, while LPMs are estimated by the ordinary least squares method. (Maddala, 2001).

In this study a LPM was chosen, as the sample size (n=1981) was relatively small. LPM has the added advantage that the coefficients are easy to interpret. For example, if one defines:

$$y = \begin{cases} 1 \ if \ a \ school \ has \ an \ SBST \\ 0 \ otherwise \end{cases}$$

Therefore, $\quad y = \beta x i + \mu i$

and $\quad E(\mu i) = 0$

Then, $\quad \mathrm{E}(y_i / x_i) = \beta x_i$

So, if $x_i = 1$ when the school is located in Gauteng province, βx_i can be interpreted as the increased probability that the school has a SBST given that it is in Gauteng province.

Heteroskedasticity (where error variance is not constant for all observations; but increases or decreases with the value of one of x_i) frequently arises when the independent variable is binary. This leads to biased standard errors, which in turn invalidates significance testing, when using the ordinary least squares method (Maddala, 2001). However, using the *svy* set of commands in Stata produces robust standard errors, overcoming any such potential bias in the standard errors.

5.   Results

Having explored the available evidence from the 2011 SMS, TALIS 2018 and several qualitative studies, and having outlined the methodology, this section presents the results of the survey. The results have been grouped into those pertaining to teacher- and school-level inputs, processes, and enablers. Most of the results are informed by the quantitative survey, but in places the results of the qualitative follow-up study have also been integrated. The final section pertains to the qualitative study alone. As the bulk of the questions in the SMS 2017 relate to teacher-level inputs, this section is presented first.

5.1   Teacher-level inputs

SMS 2017 assesses both teacher training in special needs education and teacher confidence in "dealing with learners with learning barriers". More detail was collected on training in the 2017 survey than in 2011 and several types of training were assessed in the questionnaire, as in Table 2. Respondents were asked to report on training provided by their own school, the provincial education department or training that they initiated themselves. Overall, in 78% of schools at least one educator had received some training in either learning barriers or special or remedial education.

Table 3: Proportion of schools with at least one educator trained in special needs or learning barriers in 2017.

Training types:	Total	Primary School sample	Secondary school sample
(1) Formal qualification in special or remedial education	0.45	0.47	0.39
	(0.02)	(0.03)	(0.02)
(2) Training in identifying &/or supporting learning barriers	0.74	0.78	0.63
	(0.02)	(0.03)	(0.02)
(3) Training on curriculum differentiation	0.57	0.61	0.46
	(0.02)	(0.03)	(0.02)
(4) Training on setting assessments[#]	0.43	0.47	0.33
	(0.02)	(0.03)	(0.02)
Formal qualification (1) & training (2)	0.40	0.43	0.33
	(0.02)	(0.03)	(0.02)
Sample	1966	981	985

Standard errors in parentheses. [#] for learners who are experiencing learning barriers

These estimates of training coverage in primary schools suggest that published targets (all foundation phase teachers will receive SIAS training by 2016)(Department of Basic Education, 2014a) have not been met or have been poorly targeted such that 22% of primary schools were not covered by the training.

Training in identifying or supporting learners who are experiencing learning barriers was the most frequently mentioned type of training. However, the question was quite broadly worded and would cover any training, from a formal course to short informal seminars or workshops. This is borne out by results in rows 3 and 4 of Table 3. While respondents in 74% of schools reported having received some training on identifying and/or supporting learners experiencing

learning barriers, only 57% had been trained in curriculum differentiation and only 43% had received any training on assessment differentiation (setting assessments for learners who are experiencing barriers to learning). The correlation between receiving training in identifying/supporting learners with learning barriers and in curriculum differentiation is 0.57 (across all respondents)[17] (see Appendix Table 6). Multivariate analysis (Appendix Table 7) shows that educators who have received training in learning barriers are only 39% more likely to have been trained in setting differentiated assessments. There is a particularly low level of coverage of training on setting assessments for learners who are experiencing barriers to learning in secondary schools. This corroborates the evidence in Table 3, suggesting that the training many teachers report receiving lacks depth and does not extend to covering curriculum and assessment differentiation.

The receipt of training differs by respondent type. As shown in Figure 2 below, SBST Coordinators are significantly more likely to have received training in learning barriers than Principals and Deputy Principals. Both SBST Coordinators and LSEN educators are significantly more likely than Principals to have a formal qualification in special or remedial education (see Appendix Figure 1). It is encouraging that levels of formal qualifications and of learning barriers training are higher among SBST Coordinators than among respondents in other roles as they suggest that better qualified educators are being placed in the role of SBST Coordinator, or that SBST Coordinators are being targeted by training.
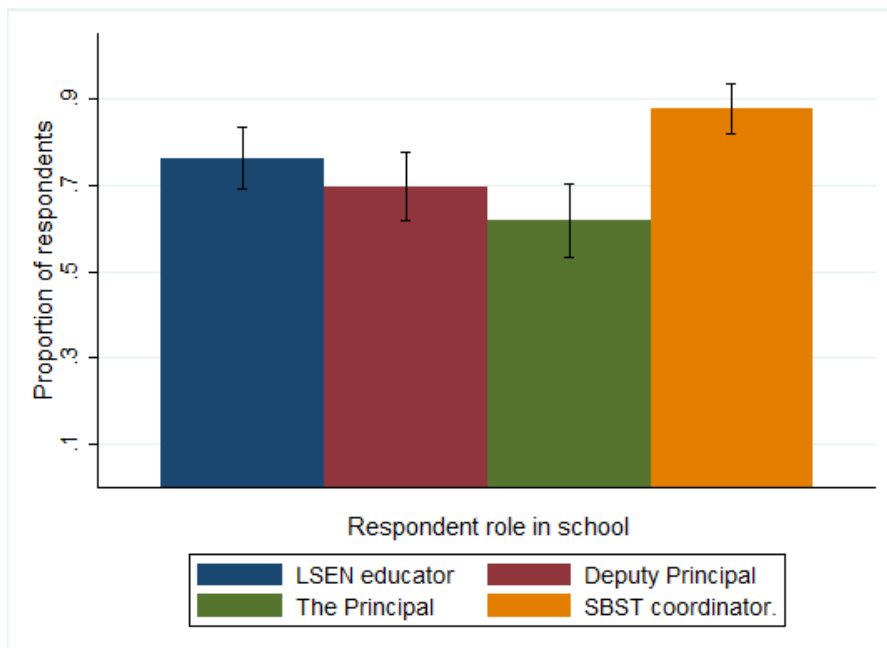
Figure 2: Proportion of educators trained (formally/informally) in identifying and supporting learners with learning barriers, by respondent role.

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[17] Multivariate regression analysis shows very similar associations between receipt of training on identifying and supporting learners experiencing learning barriers and training on curriculum differentiation and the setting of assessments to accommodate learning barriers and are not shown in this paper.

As a result of differences in training by respondent type, multivariate regression analysis was run on the full sample, and separately for two samples: a) those schools where the Principal was the respondent (column 2 in Table 4) and those where another educator was the respondent (column 3 in Table 4). Across all three samples, significantly and substantially higher proportions of schools in Gauteng, the Free State and the Western Cape had at least one trained educator than in the North West. These provincial patterns in training hold, even when controlling for school phase, quintile, being in a metropolitan area and full-service designation. Respondents in primary or combined schools were 13.4% more likely to be trained than those in high schools (total sample). Neither being in school quintile 1 to 3, nor being in a metropolitan area,[18] was associated with the probability that a respondent had been trained. There are stronger patterns of provincial variation in training levels and larger differences in training levels by school phase when the sample is limited to those schools where the Principal is the respondent.

A similar regression was estimated on data from a similar question in the Principal questionnaire[19]. Two findings are consistent across both specifications: 1) province appears to be a more important correlate of training than quintile, and 2) educators in schools in the Eastern Cape, North West and Limpopo are less likely to have received training in learning barriers or special and remedial education than in other provinces.

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[18] Quintile 4 & 5 schools are allowed to charge fees. Quintiles 1-3 are non-fee charging schools Classification into quintiles is largely based on the socio-economic profile of the geographic area in which schools are located.

[19] The dependent variable is derived from data on the number of educators in the school who have been trained in learning barriers (according to the principal).

Table 4: Probability that a school has at least one educator who has formal training in special needs or any training in identifying and supporting learners with learning barriers.

	All	Principal	Other
Western Cape	0.149***	0.469***	0.073
	(0.048)	(0.107)	(0.052)
Eastern Cape	-0.067	-0.228	-0.062
	(0.078)	(0.149)	(0.085)
Northern Cape	-0.077	0.142	-0.116
	(0.074)	(0.160)	(0.078)
Free State	0.206***	0.495***	0.139***
	(0.046)	(0.106)	(0.048)
KwaZulu-Natal	0.085*	0.307***	0.076
	(0.051)	(0.111)	(0.051)
Gauteng	0.216***	0.501***	0.145***
	(0.048)	(0.143)	(0.049)
Mpumalanga	0.120**	0.135	0.100**
	(0.050)	(0.170)	(0.047)
Limpopo	-0.098	0.084	-0.123
	(0.078)	(0.128)	(0.104)
School is in wealth quintile 1, 2 or 3	-0.017	0.068	-0.037
	(0.028)	(0.080)	(0.028)
Metropolitan area	-0.042	-0.028	-0.048
	(0.036)	(0.107)	(0.036)
Primary school	0.134***	0.215***	0.097**
	(0.036)	(0.074)	(0.042)
Designated full-service school in 2017	0.069**	0.097	0.045
	(0.033)	(0.104)	(0.034)
Constant	0.659***	0.242**	0.773***
	(0.054)	(0.122)	(0.059)
R-squared	0.089	0.214	0.076
Sample	1958	379	1579

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Col. (1) shows regression for all respondents, Col. (2) shows results where Principal is respondent, Col. (3) shows results where School-based Support Team Coordinator, LSEN Educator or Deputy Principal is respondent

A direct comparison of training coverage from 2011 and 2017 is not possible. However, comparing the patterns of results is informative. Whereas schools in lower wealth quintiles were less likely to have at least one trained educator in 2011, there was no significant difference in training coverage at the school level in 2017. The provincial differences in training coverage have persisted from 2011 to 2017, with much the same provinces lagging (Eastern Cape, Northern Cape, and Limpopo) and training coverage continues to be higher among primary schools than secondary schools. The proportion of educators with formal qualifications was much higher in 2011 (71%) compared to 2017 (45% of schools). This is possibly due to question wording. Respondents were asked about qualifications in special or remedial education, but not about specialised qualifications in inclusive education, such as the Advanced Certificate in Education in Inclusive Education or Advanced Certificate in Education in Learner Support. A request was made to update this question to include these qualifications but was denied, in order to maintain comparability with SMS 2011. This has resulted in a gap in the measurement of formal qualifications. For this reason, the data on training is viewed as more useful in this study.

When asked to rate their own confidence in "dealing with learners with learning barriers", most respondents rate themselves as "confident", but there is a fairly even spread across the four categories presented, as shown in Table 5.

Table 5: Self-rated teacher confidence in dealing with learners with learning barriers.

Self-rated confidence	% of respondents	As a binary variable:	% of respondents
Not confident	18.9	Not confident	41.3
Somewhat confident	22.4		
Confident	38.6	Confident	58.7
Very confident	20.1		

Source: School Monitoring Survey 2017 (weighted analysis) educator questionnaire

There is some evidence of acquiescence bias or socially desirable reporting in other questions in the survey. Questions on teacher self-efficacy (such as confidence) are more susceptible to acquiescence bias than the other types of questions (Vieluf, Kunter, & van de Vijver, 2013). As a result, there is reason to suspect that more than 19% of educators may lack confidence in addressing learning barriers.

Mean confidence levels among educators with formal qualifications in special or remedial education and those who have some training in identifying or supporting learners experiencing learning barriers is significantly higher than among educators who do not have this training. Educators who work in quintile 5 schools, full-service schools and schools that have a SBST in place tend to be more confident in "dealing with" learning barriers than those in other schools. On average, respondents in the Western Cape and Free State were significantly more confident in dealing with learning barriers than respondents in the Eastern or Northern Cape, KwaZulu-Natal, or the North West. Further, in schools where a higher proportion of teachers have training in identifying or supporting learners experiencing learning barriers, the respondent tended to be more confident. Mean self-rated educator confidence was significantly higher among SBST Coordinators than among Principals or Deputy Principals.

Before applying a linear probability model to data on teacher confidence, the two negative response categories ("not confident" and "somewhat confident") were combined into a single category, "not confident". The two positive response categories ("confident" and "very confident") were combined to form a dummy variable, "confident", as shown in Table 5. Again, multivariate regressions were run, with the sample split by respondent role in the school. The results of the regression analysis are shown in Table 6. Results in column (1) apply to all schools, those in column (2) apply to the sample of schools where the Principal was the respondent and those in column (3) are for the sample of schools where the LSEN educator, SBST Coordinator or Deputy Principal was the respondent. Quite different factors are shown to be associated with increased confidence depending on the role of the respondent. Among all respondents, quintile is insignificant as an explanatory variable.

Principals who have formal qualifications in special or remedial education were 23.9% more likely to report being confident in dealing with learners experiencing learning barriers than those without such qualifications, while principals in the Eastern Cape and Mpumalanga are 22.5% and 30.0% less likely to report being confident than those in the North West. There is

a large positive association between receiving support from the district for the SBST and principals' confidence. However, neither the self-reported presence of a SBST nor the receipt of training in curriculum or assessment differentiation is associated with an increase in confidence levels. Further research is needed to determine why training does not appear to shift the confidence of Principals when it comes to inclusion of learners who are experiencing learning barriers. One would need to establish whether this finding is valid for all Principals, or whether there are specific factors at play in those schools where Principals are the most qualified educator in special needs/learning barriers. Demographic differences may explain some of the variation (Principals tend to be older[20], and male) but cannot be tested here, as no data was collected on teacher characteristics.

Where the respondent was a SBST Coordinator, LSEN Educator or Deputy Principal, confidence is significantly and positively associated with prior training and formal qualifications. Training (in all its forms) is strongly associated with an increased likelihood of educator confidence. The educator is significantly more likely to be confident if there is a SBST in the school. Three types of training are included in this regression. Respondents who reported they had a formal qualification in special or remedial education were 15.4% more likely to be confident. Those who had received training on "curriculum differentiation for learners with learning barriers" were 17.4% more likely to be confident, and those who had received training on "setting assessments for learners with learning barriers" were 17.6% more likely to be confident. These associations can be interpreted cumulatively. Thus, educators who have received training in curriculum and assessment differentiation were 35% more likely to rate themselves as confident in dealing with learners who are experiencing learning barriers. Educator confidence does not differ between provinces once differences in prior training are accounted for.

A probit regression on educator confidence was conducted to test whether the findings are robust to the specification of the model. Similar associations were found to be statistically significant in the probit specification, suggesting that these findings are robust to the specification of the model. The results are shown in Appendix Table 8. The magnitude of coefficients cannot be directly compared between the linear probability model and probit specification, without transforming the coefficients of the probit regression.

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[20] There is evidence from other studies that younger educators are more positive and more confident about inclusion of learners with disabilities in ordinary schools than older educators, possibly as they are more likely to have been exposed to inclusive education thinking in pre-service training.

Table 6: Probability that respondent is confident in dealing with learners with learning barriers.

	All	Principal	Other
School has SBST	0.079	0.015	0.133**
	(0.053)	(0.089)	(0.057)
Formal qualification in special or remedial education	0.192***	0.239**	0.154***
	(0.044)	(0.095)	(0.041)
Training on curriculum differentiation	0.184***	0.138	0.174***
	(0.056)	(0.124)	(0.058)
Training on setting assessments for learners with learning barriers	0.163***	0.085	0.176***
	(0.057)	(0.135)	(0.052)
District visit for purpose of supporting SBST	0.077*	0.279***	-0.020
	(0.045)	(0.095)	(0.042)
Western Cape	-0.010	-0.108	0.051
	(0.067)	(0.151)	(0.068)
Eastern Cape	-0.025	-0.225*	-0.025
	(0.066)	(0.116)	(0.072)
Northern Cape	-0.072	-0.011	-0.049
	(0.072)	(0.145)	(0.079)
Free State	0.017	-0.247	0.061
	(0.068)	(0.208)	(0.063)
KwaZulu-Natal	-0.035	0.020	-0.014
	(0.069)	(0.115)	(0.074)
Gauteng	-0.068	-0.261	-0.041
	(0.066)	(0.194)	(0.070)
Mpumalanga	-0.005	-0.300**	0.032
	(0.058)	(0.117)	(0.061)
Limpopo	0.093	0.118	0.106
	(0.067)	(0.126)	(0.078)
School is in wealth quintile 1-3	0.025	0.024	0.045
	(0.042)	(0.092)	(0.043)
Constant	0.220***	0.129	0.255***
	(0.076)	(0.144)	(0.088)
R-squared	0.221	0.272	0.216
Sample	1916	372	1925

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Col. (1) shows regression for all respondents, Col. (2) shows results where Principal is respondent, Col. (3) shows results where School-based Support Team Coordinator, LSEN Educator or Deputy Principal is respondent. North West is omitted category for province.

5.2 School-level inputs

While the bulk of SMS 2017 evaluates teacher training for inclusion, the presence of SBSTs and district-level support is also evaluated. In 2017 Principals in 67% of all schools report that they have SBSTs in place, which is a substantial increase since 2011 (54%). Significant improvements were made from 2011 to 2017 in the Western Cape, the Northern Cape, North West, Mpumalanga, and Limpopo, as shown in Table 7. Improvements in SBST coverage occurred across all quintiles from 2011 to 2017, although the evidence of improvement in quintile 1 is fairly weak (only significant at the 10% level) and comes off a low base. In 2017, 90% of schools in quintile 4 or 5 reported having a SBST. This is significantly higher than among schools from less wealthy areas (quintile 1 to 3 schools).

Table 7: Proportion of schools with school-based support teams in place (self-reported): 2011 and 2017.

		2011	2017
By province	Western Cape	0.84	0.95**
		(0.03)	(0.02)
	Eastern Cape	0.47	0.54
		(0.03)	(0.06)
	Northern Cape	0.52	0.82**
		(0.04)	(0.07)
	Free State	0.72	0.84
		(0.04)	(0.12)
	KwaZulu-Natal	0.56	0.62
		(0.03)	(0.05)
	North West	0.48	0.83**
		(0.04)	(0.04)
	Gauteng	0.98	0.99
		(0.01)	(0.00)
	Mpumalanga	0.72	0.91**
		(0.03)	(0.02)
	Limpopo	0.14	0.39**
		(0.02)	(0.05)
By school wealth quintile	Quintile 1	0.43	0.56*
		(0.02)	(0.05)
	Quintile 2	0.45	0.67**
		(0.02)	(0.04)
	Quintile 3	0.58	0.68**
		(0.02)	(0.04)
	Quintile 4	0.74	0.90**
		(0.03)	(0.02)
	Quintile 5	0.78	0.90*
		(0.03)	(0.03)
		(0.01)	(0.02)
All		**0.54**	**0.67**
		(0.01)	**(0.02)**
Sample		1922	1960

Standard errors in parentheses. Source: School Monitoring Survey 2011 and 2017 Principal interview (school-weighted data). ** $p<0.05$, * $p<0.1$ (2017 compared with 2011 data).

By 2017, Limpopo is the only province where less than half of the schools report having a SBST. Substantial differences in coverage of SBSTs by province remain by 2017. These differences do not reflect provincial differences in disability prevalence among children of school-going age, as shown in Table 8.

Table 8: Presence of disability support structures and disability prevalence (%), by province.

	Proportion of schools with SBST (2017)	Proportion of SBSTs that received district support (2017)	Disability prevalence rate (%): children (7 to 18 years) (2016)
Western Cape	0.95** (0.02)	0.90** (0.02)	1.78** (0.001)
Eastern Cape	0.54 (0.06)	0.47** (0.06)	2.86** (0.001)
Northern Cape	0.82 (0.07)	0.57 (0.07)	3.86** (0.002)
Free State	0.84 (0.12)	0.84** (0.04)	4.86** (0.001)
KwaZulu-Natal	0.62 (0.05)	0.61 (0.07)	3.31** (0.001)
North West	0.83** (0.04)	0.82** (0.03)	3.69** (0.001)
Gauteng	0.99** (0.00)	0.81** (0.04)	2.62** (0.001)
Mpumalanga	0.91** (0.02)	0.69 (0.04)	3.29** (0.001)
Limpopo	0.39** (0.05)	0.36** (0.06)	2.87** (0.001)
South Africa	**0.67** **(0.02)**	**0.65** **(0.02)**	**3.03** **(0.000)**
Sample	1960	1542	760854

Standard errors in parentheses. ** $p < 0.05$ (compared with national mean).

Sources: School Monitoring Survey 2017 & Community Survey 2016 (own calculations).

Notes: In Community Survey 2016, the Washington Group Short Set of questions was used to measure disability. Children were classified as having a disability if the caregiver reported the child had a lot of difficulty or were completely unable to function in at least one domain, or reported child had some difficulty in at least two domains. In Col 2 the sample is limited to those schools that have a SBST.

SBST = school-based support team. Dark grey shading indicates that the coverage of SBST, or disability prevalence is above national average, in that province. Light grey shading indicates that SBST coverage or disability prevalence is below the national average in that province.

To disentangle the effects of province, quintile, and school size in explaining SBST coverage, a linear probability regression model was estimated. The results (shown in Table 8) suggest a more nuanced finding: schools in Limpopo, the Eastern Cape and KwaZulu-Natal are significantly and substantially less likely to have a SBST than schools in the North West once the effect of quintile and school size are accounted for. The effect is particularly large in Limpopo: schools in that province are 41.7% less likely to have a SBST than schools in the North West. Large schools are 11.5% more likely and full-service schools 10% more likely to have a SBST, ceteris paribus. Quintile 2, 4 and 5 schools are more likely to have a SBST than quintile 1 schools (schools in the poorest areas). SBST coverage varies more by province and school-size than by quintile and does not vary between metropolitan and non-metropolitan areas once other covariates are controlled for.

Table 9: Probability that school has a school-based support team in 2017 (self-reported).

	Probability of having a SBST
Western Cape	0.050
	(0.054)
Eastern Cape	-0.269***
	(0.069)
Northern Cape	-0.024
	(0.074)
Free State	-0.009
	(0.115)
KwaZulu-Natal	-0.199***
	(0.067)
Gauteng	0.073
	(0.048)
Mpumalanga	0.062
	(0.050)
Limpopo	-0.417***
	(0.064)
Quintile 2	0.110**
	(0.055)
Quintile 3	0.062
	(0.064)
Quintile 4	0.089*
	(0.053)
Quintile 5	0.103*
	(0.052)
Large school (>600 learners)	0.115***
	(0.032)
Designated full-service school in 2017	0.100**
	(0.041)
Metropolitan area	0.056
	(0.036)
Constant	0.728***
	(0.054)
R-squared	0.210
Sample	1921

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: School Monitoring Survey 2017, Principal interview (school-weighted). North West is the omitted category for Province and Quintile 1 is the omitted category for school wealth quintile.

Table 8 shows that 65% of SBSTs received support from the district for during a district visit in 2017. This is a substantial improvement on 2011, where only 34% of SBSTs received such support(Department of Basic Education, 2013b). Table 8 also illustrates that SBSTs in Limpopo and the Eastern Cape were less likely to receive any support during district support visits.

Regression analysis confirms the existence of significant provincial differences in the provision of support from the district. Regression results (in Table 10) show that SBSTs in the Eastern Cape, Northern Cape, KwaZulu-Natal, Mpumalanga, and Limpopo were less likely to receive district support than those in the North West, while SBSTs in the Western Cape were more likely to receive such support. The differences by province are large, in some cases: SBSTs

in Limpopo are 44%; Eastern Cape are 34% and in the Northern Cape are 23% less likely to receive support than SBSTs in the North West.

Table 10: Probability that a school receives district support for its school-based support team.

Western Cape	0.096**
	(0.048)
Eastern Cape	-0.338***
	(0.073)
Northern Cape	-0.232***
	(0.082)
Free State	0.003
	(0.053)
KwaZulu-Natal	-0.187**
	(0.078)
Gauteng	0.007
	(0.055)
Mpumalanga	-0.146**
	(0.057)
Limpopo	-0.440***
	(0.070)
School is in wealth quintile 1-3	0.088**
	(0.040)
Large school (>600 learners)	0.101***
	(0.037)
Designated full-service school in 2017	0.135***
	(0.043)
Constant	0.690***
	(0.054)
R-squared	0.140
Sample	1510

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample = schools where Principal reported having a School-based support team in place. Where: North West is the omitted category for province.

In previously tested regressions, neither school density in the district (the number of schools in the district) nor location in a metropolitan area is independently associated with receiving SBST support from the district. SBSTs in large schools are shown to be 10% more likely to receive support than those in small schools. There is weak evidence of a fairly small positive association between being in school wealth quintile 1-3 and receiving support from the district.

A second aspect of district support for learners with disabilities and/or those experiencing learning barriers relates to specialist support to schools. Overall, 47% of Principals reported their school had received a visit from at least one of the following in 2017: psychologists, therapists, members of the district-based support team, learning support officials or health officials. There was no significant improvement in the provision of these services between 2011 and 2017[21].

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[21] Whether one considers the full sample of schools (44% of schools in 2011, 95% confidence interval (42.9% - 46,3%) or those schools with a SBST (2011, 57% of schools, s.e. = 0.02).

Coverage is much higher among primary (and combined) schools than in secondary schools. The Western Cape outperforms all other provinces in the provision of specialist district and/or health services to schools in 2017, as illustrated in Figure 3. The provincial differences are substantial. Low levels of specialist support from the district and the provincial differences in this provision have a bearing on school-level screening processes, which are discussed in the next section.
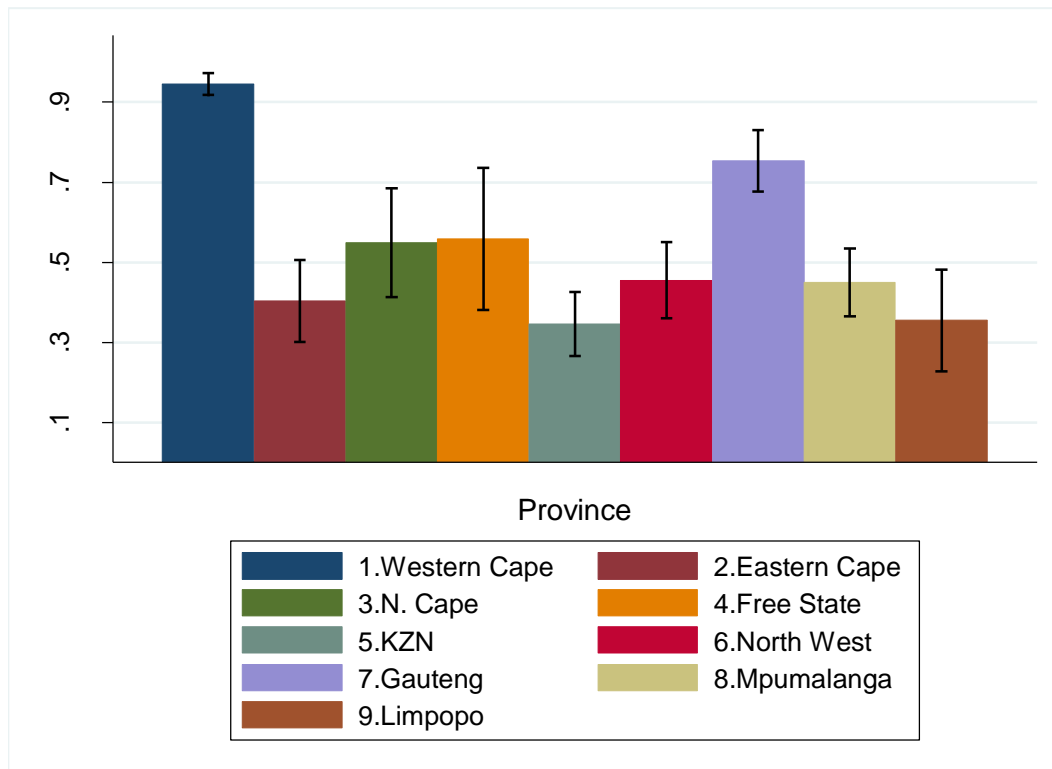

Figure 3: Proportion of schools visited by psychologists, therapists, members of the District-based support team, learning support officials or health officials in 2017, by province.

5.3   Process indicators

Less than 50% of schools are able to screen at least some learners' hearing or vision or screen at least some learners for possible learning barriers. Educators' and Principals' responses to these questions are highly consistent (as shown in Table 11), which suggests the data is reliable. The results are consistent, whether the analysis is conducted from the school-level (shown in Table 11) or the learner-level (shown in Appendix Table 9). However, other data suggests that these may be overestimates of schools' ability to screen. In a follow-up question posed to those respondents who reported being able to screen at least some learners for learning barriers, 15% of respondents conceded that no screening had been done, when probed to provide details. A further 16% were unable to provide details. This strongly suggests over-reporting of the ability to screen for learning barriers. If these responses are removed from the results, only 33% of schools are in fact able to screen for learning barriers.

Table 11: Proportion of schools able to screen at least some learners for visual, hearing or learning difficulties.

Proportion of schools:	Educator questionnaire	Principal Interview
Able to screen at least some learners for visual difficulties	0.47	0.47
	(0.02)	(0.02)
Able to screen at least some learners for hearing difficulties	0.41	0.42
	(0.02)	(0.02)
Able to screen at least some learners for learning barriers	0.41	0.37
	(0.02)	(0.02)
Where SIAS forms completed for at least one learner in the school	0.50*	-
	(0.02)	-
Sample	1966	1973

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: School Monitoring Survey 2017, educator and principal questionnaire.

Inter-provincial differences in the proportion of learners in schools that can screen learners' vision and hearing are illustrated in Table 12. Learners in Gauteng and the Western Cape are significantly more likely to be enrolled in schools that can screen learners vision or hearing. These indicators paint a more optimistic picture of health screening coverage than the School Health screening coverage indicator, as shown in Table 12. According to the School Health Screening coverage indicator, 33% of learners in Grade 1 were screened in 2017 (Bamford, 2019).

Table 12: Proportion of learners enrolled in primary schools that can perform health screening, compared with DHIS screening coverage.

	Proportion of learners in primary schools that can screen vision	Proportion of learners in primary schools that can screen hearing	Proportion of Grade 1 learners screened (DHIS)
Western Cape	0.75**	0.67**	0.46
	(0.04)	(0.04)	
Eastern Cape	0.43	0.40	0.26
	(0.05)	(0.05)	
Northern Cape	0.40**	0.36**	0.11
	(0.05)	(0.05)	
Free State	0.50	0.41	0.26
	(0.05)	(0.05)	
KwaZulu-Natal	0.56	0.52	0.25
	(0.04)	(0.04)	
North West	0.51	0.46	0.50
	(0.05)	(0.05)	
Gauteng	0.74**	0.68**	0.35
	(0.04)	(0.05)	
Mpumalanga	0.44	0.31**	0.23
	(0.05)	(0.04)	
Limpopo	0.52	0.47	0.50
	(0.05)	(0.05)	
South Africa	**0.56**	**0.49**	**0.33**
	(0.02)	**(0.02)**	
Sample	1043	1043	52 districts

Standard errors in parentheses. ** $p < 0.05$ (compared with national mean).

Where DHIS = District Health Information System.

Source: Data in columns 1, 2 are from the School Monitoring Survey 2017, educator questionnaire (learner-weighted data). Data in Col 3 is from the District Health Information System, reported in the District Health Barometer 2017/18.

Multivariate analysis demonstrates that Gauteng schools and primary schools were more likely to be able to screen learners' vision than other schools, even once school size, phase, presence of a SBST and previous training are accounted for (as shown in Appendix Table 10). This result is consistent, regardless of who answered the questionnaire. Schools with SBSTs are more likely to be able to screen learners' vision (according to Principals). Schools in Gauteng and the Western Cape, primary schools, and those with SBSTs are more likely to be able to screen learners' hearing (as shown in Appendix Table 11)[22]. School quintile is not significant in explaining variation in health screening ability.

Table 11 demonstrates that half the sampled schools reported being unable to complete the Screening, Identification, Assessment and Support (SIAS) forms, even for one learner. As the name suggests, the SIAS forms are an integral part of the process of screening for learning

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[22] The receipt of support from the district for the SBST is not included in the regression analysis. The ability to screen learners for visual, hearing and learning difficulties is positively, but not very strongly, correlated with the districts' support to the SBST (see Appendix Table 12). However, the direction of causality is not clear.

barriers and identifying learners at risk, but also go beyond this, to identify the additional support needed by the learner[23]. A substantially higher proportion of schools report being able to complete the SIAS forms for one or more learners, than report being able to screen at least some learners. This inconsistency suggests possible problems with understanding the questions or the concept of screening, which will be elaborated on in the discussion.

The findings of the qualitative study corroborate this data as they illustrate that the completion of the Support Needs Assessment forms, or review of a learner by the SBST, is not seen by educators as screening.

> *"No screening happens at this school. Screening happens at the special school. If we think a child has a problem, we ask the district, and the district refers the child to the special school for screening as they have the special equipment. At the school, we just fill the SNA (Support Needs Assessment) forms in and ask for help if we feel there is a problem with the learner."*

Several responses illustrated that screening is often equated to medical tests. Another response suggested that learning barriers do not require screening, such as with hearing and vision. Instead, the educators just "picked these up".

A telling comment was made by a respondent from a full-service school:

> *"Often other schools ask us: What is screening?"*
> *(SBST Coordinator, Free State)*

As a result, multivariate analysis focused on the data on the more specifically-worded question on ability to complete SIAS forms, rather than data on the ability to screen learners experiencing learning barriers. The multivariate analysis shows that schools in Gauteng, primary schools, and schools where the respondent had prior training were more likely to complete these forms than other schools, even when other school-level characteristics are controlled for, as shown in Table 13. This result is consistent, regardless of the respondents' role in the school. Prior training[24] increases the probability that the school was able to complete these forms by 15% (where the Principal is the respondent) and 21% (where another educator is the respondent). Schools in Metropolitan areas and those with SBSTs are better able to complete the SIAS forms, according to reports by SBST Coordinators, LSEN Educators and Deputy Principals.

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[23] They include a support needs assessment forms (the first of which is completed by the class teacher, the second by the SBST and the third by the district-based support team, if required). The forms completed by the class teacher include initial screening and identify areas where the learner needs more support. In cases where the class teacher is unable to successfully intervene to support the learner, the barriers identified and strategies implemented by the class teacher are reviewed in the second set of forms by the SBST, culminating in a SBST assessment and intervention schedule. This may include an individual support plan. Only when interventions by the SBST fail, or formal medical assessment is required is the case referred to the District-based Support (and the District-based Support Needs Assessment is completed). At this stage, the Health and Disabilities form will be completed by a medical practitioner, should formal assessment be required.

Table 13: Probability that a school is able to complete SIAS[#] forms for at least one learner.

	All	Principal	Other
Western Cape	0.094	0.237	0.085
	(0.081)	(0.153)	(0.092)
Eastern Cape	0.152**	0.050	0.154**
	(0.068)	(0.128)	(0.077)
Northern Cape	0.006	-0.036	0.095
	(0.073)	(0.098)	(0.077)
Free State	0.172*	0.296	0.160
	(0.096)	(0.199)	(0.102)
KwaZulu-Natal	0.038	0.128	0.089
	(0.074)	(0.095)	(0.078)
Gauteng	0.261***	0.471***	0.220***
	(0.065)	(0.143)	(0.074)
Mpumalanga	0.026	-0.078	0.037
	(0.064)	(0.088)	(0.072)
Limpopo	0.126	0.108	0.194*
	(0.084)	(0.108)	(0.107)
Respondent is trained [##]	0.236***	0.147**	0.209**
	(0.061)	(0.075)	(0.087)
School has a school-based Support Team	0.176***	-0.005	0.263***
	(0.056)	(0.106)	(0.062)
Primary (or combined) school	0.141***	0.131*	0.174***
	(0.043)	(0.070)	(0.050)
School is in wealth quintile 1-3	-0.073*	0.015	-0.074*
	(0.039)	(0.085)	(0.042)
Metropolitan area	0.079**	0.068	0.086**
	(0.040)	(0.096)	(0.043)
Designated full-service school in 2017	0.242***	0.307	0.186***
	(0.052)	(0.225)	(0.052)
Constant	0.034	-0.019	-0.001
	(0.080)	(0.123)	(0.096)
Sample	1924	1975	1930

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. [#] Screening, identification, assessment and support forms. These include the support needs assessment forms to be completed by multiple role-players. [##] has either a formal qualification in special needs or remedial teaching or any learning barriers training. Column 1 shows regression for all respondents to educator questionnaire, Col.2 shows results where Principal is respondent, Col.3 shows results where SBST Coordinator, LSEN Educator or Deputy Principal is respondent Source: School Monitoring Survey 2017, educator questionnaire.

5.4   School-level enablers

Two aspects of **physical accessibility** of the school for learners who use wheelchairs were assessed in 2017: accessibility of the main entrance to the school and of toilets. Both were measured through self-report (by the educator) and from observation. However, the results were poorly correlated (as shown in column 4 of Table 14), and there were large differences in mean reporting, between the observed and self-reported on wheelchair toilets. All the same, the proportion of ordinary schools with wheelchair-accessible toilets almost doubled from 2011

to 2017, as shown in Table 14[25]. Univariate and multivariate analysis show there was no significant difference in wheelchair toilet provision by school quintile in 2017.

Table 14: Indicators of physical accessibility of ordinary schools.

Proportion of schools with:	2011 Observed data	2017 Observed data	Self-reported data	ρ
At least one toilet suitable for wheelchair users	0.16	0.31	0.48	0.65
	(0.01)	(0.02)	(0.02)	
Stairs at main entrance	-	0.28	0.26	0.59
		(0.02)	(0.02)	
Stair-free or ramped main entrance*	-	0.84	0.86	0.52
	-	(0.02)	(0.02)	

Standard errors in parentheses. Data source: School Monitoring Survey 2011 & 2017.

* This measure is created by combining two questions (Are there stairs at the entrance of the school? If yes, in your opinion, is there a ramp in a good condition that is not too steep, that could be used by a person in a wheelchair).

The findings of the qualitative research suggest that respondents found the questions on physical accessibility more difficult to understand, largely because most had not considered these questions before. As one respondent explained:

> *"The questions on wheelchairs were difficult to answer because I had not opened my eyes. I couldn't answer whether there were ramps and stairs. The question made me open my eyes and look and ask other teachers. I wasn't aware of it, but we do have some ramps. We don't have special toilets." (SBST Member, Western Cape)*

Further, the wording of the question about ramped access *("*In your opinion, is there a ramp in a good condition that is not too steep, that could be used by a person in a wheelchair?") was reported to be difficult to understand. This question was adopted from among the recommended questions in a technical guide on including disability measures in EMIS (UNICEF Education Section, 2016). The question is long-winded, and this may have made it difficult to understand. More fundamentally, it may be difficult for an educator who has no experience with using a wheelchair to judge whether a ramp is "not too steep" or "in good condition". This question may produce more reliable data when completed by a trained fieldworker or a member of a disabled people's organisation. Because of discrepancies between the observed and self-reported data, and the results of the qualitative study, all further analysis is based on observed data, which was judged to be more accurate.

Overall, 84% of schools were found to have wheelchair-accessible main entrances (stair-free or with a suitable ramp), but there are large differences in accessibility by province, as shown in Table 15. Only 60% of schools in the Western Cape were found to have accessible entrances. This is significantly lower than the national average. The poorer accessibility in the

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[25] In 2011 self-reported data was not collected on sanitation. All comparison of 2011, 2017 data was based on fieldworker observation.

Western Cape is driven by the larger proportion of schools with stairs at the main entrance in that province.

Table 15: Proportion of schools with accessible entrance, by province.

	Stairs at main entrance	Stair-free or ramped
Western Cape	0.629**	0.602**
	(0.047)	(0.056)
Eastern Cape	0.184	0.875
	(0.032)	(0.026)
Northern Cape	0.506**	0.706
	(0.067)	(0.065)
Free State	0.288	0.818
	(0.054)	(0.040)
KwaZulu-Natal	0.189	0.886
	(0.030)	(0.023)
North West	0.384	0.843
	(0.050)	(0.045)
Gauteng	0.318	0.795
	(0.044)	(0.042)
Mpumalanga	0.199	0.916
	(0.032)	(0.025)
Limpopo	0.334	0.812
	(0.064)	(0.069)
South Africa	**0.277**	**0.837**
	(0.018)	**(0.016)**
Sample	1978	1978

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Data source: School Monitoring Survey 2017.

Similar patterns exist by quintile. Quintile 4 schools are less likely to have a wheelchair-accessible front entrance than the average school. It seems this result is driven by higher proportions of schools with stairs at the front entrance in quintile 4 and 5 schools.

Table 16: Proportion of schools with accessible entrance, by quintile

	Stairs at main entrance	Stair-free or ramped
Quintile 1	0.191	0.861
	(0.037)	(0.036)
Quintile 2	0.219	0.897
	(0.030)	(0.023)
Quintile 3	0.287	0.820
	(0.033)	(0.026)
Quintile 4	0.523**	0.662**
	(0.045)	(0.045)
Quintile 5	0.595**	0.734
	(0.043)	(0.040)
South Africa	**0.277**	**0.837**
	(0.018)	**(0.016)**
Sample	1978	1978

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data source: School Monitoring Survey 2017.

5.5   Results of the qualitative follow-up study.

One of the key changes in the questionnaires from 2011 to 2017 is in terminology used to describe learners who require additional support in the school system. In 2011 the term "learners with special educational needs" was used, while in 2017 this was updated to "learners with learning barriers" (everywhere except in the title of the questionnaire). This term is broader and more closely aligned with domestic inclusive education policies (such as SIAS, 2014). There was some concern that educators would not be familiar with this terminology. To address these concerns, in the follow-up qualitative study, Principals and teachers were asked about their own understanding of the term "learners with learning barriers"[26]. Two of the thirteen respondents gave very generic descriptions and were not keen to elaborate. This suggested that they were not comfortable that they fully understood the concept of learning barriers. One participant defined learners with learning barriers as:

> *"Learners who can't cope with learning." (SBST Coordinator, Free State)*

The other eleven respondents elaborated at length, giving examples of the types of learners they had encountered in their own school. Their understanding varied somewhat. Some respondents had a narrow interpretation, while others reported it as being a broad concept. Those respondents who described it as a broad concept seemed to understand that learners who experience learning barriers encompassed a wide range of learners with varying levels of support need:

> *"To me this is a wide concept. There are those who have physical defects, such as size, hearing, seeing and then there are those who have intellectual challenges, where physically there are no problems, you can't see anything wrong with the learner, but they can't grasp things at the same speed as others, for example slow learners." (Principal, Limpopo)*

Two respondents started with the phrase "Learning barriers can be anything that …", and another two respondents began with "It is a wide/broad concept". For example:

> *"Learning barriers are anything that hinders a child from learning successfully: reading problems, reading with comprehension, vision, handwriting … anything that is preventing the child from achieving academically."*

It seems from the descriptions provided that most educators see "learners with learning barriers" as a broader group of learners than "learners with special education needs". Most respondents then went on to mention a list of barriers that were internal to the learner, such as in the response above. One respondent, for example, emphasised that learning barriers were an intrinsic factor:

> *"Learners who struggle in the mainstream due to an intrinsic factor. These learners who have something intrinsic that causes them not to function on the same level as their peers." (member of SBST, Western Cape)*

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[26] The term "learners who are experiencing learning barriers" would have been preferable as the terminology here may reinforce the idea that all learning barriers are internal to the learner.

Only one respondent directly mentioned a barrier that was created by the school environment at that school (class size):

> *"…. In the classroom it could be because of overcrowding, or some are disabled, some cannot write well." (Principal, Limpopo)*

Four respondents mentioned factors that arise from the education system (such as uniform expectations for an age-level), but the problem was still seen to originate in the child, not the system. For example:

> *"Some learners have academic barriers; some have barriers because they are disabled in some way that this makes them to not grasp the curriculum as expected." (Remedial teacher & SBST member, Free State)*

> *"Children with barriers need to work at their own pace." (SBST member, Western Cape)*

While several respondents mentioned the socio-economic circumstances of the learners' families in the interview, only one mentioned them in response to the question about learning barriers.

> *"The child has something that naturally stops the learner from performing at the level as other learners. Either the child was born with something, or it happened due to an accident…Other learners are not performing well due to the background at home and the socio-economics." (SBST Coordinator, Free State).*

Some educators reported a wide range of support that is provided to socio-economically disadvantaged learners. But most educators did not perceive the socio-economic context as a barrier to learning. Neither behavioural difficulties nor attitudinal barriers were mentioned as being potential barriers to learning. Overall, the responses suggest that most respondents are aware of the concept of learning barriers but tend to see these barriers as arising from within the learner. Environmental and attitudinal barriers that learners may experience in schools and communities are poorly understood. Some educators understand the term in more depth than others.

6. Discussion

Neither the wording of SMS 2011 ("learners with special educational needs") nor the wording of the SMS 2017 ("learners with learning barriers") directly applies to the group of particular interest in this paper (learners with disabilities). The results of the qualitative study, outlined immediately above, suggest that, in general, the respondents understood "learners with learning barriers" to include learners with disabilities as well as other learners with lesser participation limitations. The wording may have skewed the participants to think mainly about learners with intellectual and learning disabilities. However, as this is the largest disability group in South African schools, this is not necessarily a problem. Specific questions about physical accessibility, vision and hearing should have prompted the respondents to consider these impairment types too. Overall, the same support structures serve learners with special

educational needs, learners with learning barriers, and learners with disabilities. The questions on formal qualifications addressed the area of special needs and remedial teaching while questions on training were specific to learners with learning barriers. Overall, the survey provides good evidence of disability support and accessibility, even though only a few questions directly ask about learners with disabilities.

The results suggest there are substantial gaps in the current teacher training for inclusion. Both curriculum differentiation and setting assessments are core skills which educators require to support learners who are experiencing barriers to learning, and too few teachers have been trained in these areas. It is particularly worrying that coverage of training on setting differentiated assessment is so low in secondary schools as the process of granting concessions for assessment usually only begins in secondary school. These findings align with TALIS 2018, which found a large proportion of lower secondary school teacher reporting a high need for training in teaching special needs students. A renewed focus on training on concessions, curriculum differentiation and differentiation of assessment is clearly needed, especially in secondary schools.

The estimated 19% (or more) of teachers who are not confident in dealing with learners with learning barriers is discouraging for the implementation of inclusion. Teachers who are not confident have shown to be less likely to adopt inclusive teaching practices, in high-income countries.

These results provide evidence of a strong relationship between training and increased confidence in addressing learning barriers among SBST Coordinators, LSEN educators or Deputy Principals. The results suggests that if levels of SBST coverage and SBST support from districts, and coverage of teacher training in under-performing provinces could be raised to the levels seen in the Western Cape, Gauteng or the Free State, the differences in teacher confidence, by province, could be eliminated. This is extremely encouraging as it provides policy levers to address inequality between provinces. School wealth quintile is not associated with lower teacher confidence once key inputs are factored into the regression[27].

SMS 2017 focuses on measuring teacher training, qualifications, and confidence rather than measuring attitudes to learners with disabilities, knowledge of approaches to dealing with learning barriers, or teacher skill in teaching learners with disabilities. Indirectly the results (particularly the poor self-reported ability of schools to screen learners) hint at low skill levels among teachers and cast some doubt on whether current training provides teachers with the skill to screen learners. The results suggest that educators do not understand the concept of screening. Evidence from the qualitative survey and responses to open-ended questions in the quantitative survey suggest that screening for learning barriers is closely associated with medical screening rather than SIAS processes. This thinking may lead schools to view screening as something outside their sphere of influence or expertise. The results of TALIS 2018 point to low perceived levels of competence in teaching learners with special needs effectively. The results of both surveys thus suggest that further deepening of training may be required to ensure there are enough teachers trained in each school to form an effective team. Skill level of SBSTs should be assessed in more depth in a smaller sample of schools.

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[27] There is a small risk that there is more tendency to SDR in lower quintile schools, resulting in inflated reports of confidence levels in these schools, but this cannot be assessed in this data.

The presence of a SBST emerges as one of the key determinants of a school's ability to screen learners for visual, hearing or learning difficulties, and of teacher confidence (where the respondent is someone other than the Principal) and acts as a gateway to receiving specialist support from the district (psychologists, social workers, etc). Between 2011 and 2017 there has been a significant and substantial increase in the proportion of schools which report having a SBST in place. However, large differences in the probability that a school has a SBST, by province, remain. There was no significant growth in SBST coverage in the Eastern Cape and KwaZulu-Natal. The lack of improvement in KwaZulu-Natal is particularly concerning as prevalence of disability among children of school-going age is higher than average in this province. Quintile 1 schools are lagging other schools in reported presence of SBSTs.

Once SBST presence is controlled for, there is very little association between school wealth quintile and various measures of disability support or disability-accessibility. This provides another key policy lever: the proportion of quintile 1 schools with SBST must be raised from current levels (56%) to the levels reported by quintile 4 and 5 schools (90%) in order to reduce wealth inequalities in disability support.

Reported levels of district support to the SBST have almost doubled from 2011 to 2017 and this is cause for celebration. Even more promising, there is evidence that schools from lower quintiles are more likely to receive such support for their SBSTs. This suggests a prioritisation of SBST support in less wealthy areas. Unfortunately, levels of support are still far too low in some provinces. If the existence of support structures is a rough proxy for accessibility of the learning environment, as Watkins suggests, this means learning environments are much less accessible in the Eastern Cape, KwaZulu-Natal, and Limpopo than in other provinces. On the flipside, learning environments in the Western Cape and Gauteng are much more accessible than in other provinces.

Unfortunately, there was no significant improvement in the proportion of schools visited by district specialists (psychologists, social workers, therapists, learning support specialists) or by health officials from 2011 and 2017. A substantial improvement was expected in this period as the Integrated School Health Programme was introduced in 2012 and had achieved screening coverage of about 33% of Grade 1 learners by 2017.

Several of the findings in this study corroborate previous evidence on the uneven funding of inclusive education between provinces (Budlender, 2015). They suggest that the large provincial differences in the number of functional district support teams (and staff appointed to these teams) reported in 2013 may still exist in 2017. In 2013 there were particularly low levels of district support in the Eastern Cape and Limpopo and 37% of all district inclusive education officials were employed in Gauteng (Government of the Republic of South Africa, 2013).

These results suggest a failure to entrench the screening process in schools. Due to differences in question wording, the results pertaining to screening cannot be directly compared between 2011 and 2017. Despite this, the 2017 results are quite similar to the results of the SMS 2011 (where 47% of schools reported being able to screen at least some learners for special education needs, as against 41% of schools being able to screen for barriers to learning in 2017). This comparison does not suggest much progress has been made in this area from 2011 to 2017.

The inconsistencies between reporting on the ability to complete SIAS forms and the ability to screen learners suggests either a poor understanding of screening, or problems with the wording of the questions. The question on a school's ability to screen learners for learning barriers was immediately preceded by questions about the school's ability to screen learners' hearing and vision. The positioning of the question may have pre-disposed educators to thinking of learning barrier screening as a medical process, rather than something that was embedded in the SIAS process. More fundamentally, the idea of screening *learners* for learning barriers is problematic, as the wording firmly locates the learning barrier within the child. A question on whether the school had identified any learning barriers in the school environment would have more appropriate.

Neither the SMS health screening indicators presented in this paper nor the District Health Information System (DHIS) Grade health screening coverage indicators suggests acceptable coverage of vision nor hearing screening. Both suggest a substantial risk that hearing or visual impairments are not identified in the early grades. Across both data sources, screening appears to be more entrenched in primary schools than in secondary schools. Both indicators suggest wide inter-provincial differences in screening capacity, which could have serious implications for learning and income inequality between provinces.

Given that the questions on screening of vision and hearing in the 2017 survey may not have performed well and may have biased educators to think of screening for learning difficulties as a medical process and given that the findings are in line with those reported in the DHIS, it may be advisable to drop these two questions from the next survey and to rely on the DHIS data on health screening coverage instead. In their place, a simple question on the number of children per class observed to be wearing eyeglasses or hearing aids should be included in the classroom observation in the SMS as this observable data may act as a better proxy for access to screening and eye health services. A simple question along these lines was used in the Early Grade Reading Study II in teacher interviews and at the end of the learner (reading) assessment (Department of Basic Education & University of the Witwatersrand, 2017). The plan is to analyse this data against norms for prevalence of refractive errors among young children to estimate the level of unmet need for eyecare in these schools.

There is evidence of impressive progress in the proportion of schools observed to have a wheelchair-accessible toilet from 2011 to 2017. SMS 2017 also shows that in 2017, 20% of schools in the sample did not have suitable toilets which met the specified norms for any learners[28]. While this is discouraging, it points to an opportunity to improve wheelchair toilet access at low cost. If the principles of universal design (and national building regulations) are followed in upgrading the sanitation facilities at this 20% of schools, wheelchair-accessibility could be greatly improved. Further, this improvement would be realised in the poorest schools. Evidence suggests that where universal design is followed from the project conception, the total construction cost of designing and constructing fully accessible buildings are just one percent higher than the costs of building inaccessible buildings (World Bank, 2005). Thus, South Africa should be able to provide wheelchair-accessible toilets in a further 20% of schools in the near future, with only a one percent increase in the budget for infrastructure development, provided wheelchair accessibility is included at the design phase and

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[28] That is, suitable toilets (flush or ventilated, improved pit latrines or enviroloos), with separate toilets for boys, girls, and educators.

guidelines, such as those produced by the World Bank (World Bank, Snider, & Takeda, 2008) to ensure cost containment, are followed.

The results described here show that, in most schools, the school entrance is not a major barrier to inclusion of learners with physical disabilities. There are substantial accessibility challenges in quintile 4 schools and those in the Western Cape which still need to be addressed. Renovation of quintile 4 and Western Cape schools will need to be prioritised to make them more accessible to wheelchair users.

Some caution should be exercised when interpreting the overwhelmingly positive reported data on these two aspects of physical accessibility of schools. Firstly, there is substantial inconsistency between the self-reported and observed data. This suggests there may have been some confusion around which was the main entrance, or an element of socially desirable self-reporting. The results of the qualitative study lend support to the notion that educators had difficulty recalling the details of the school buildings and had low sensitivity to barriers in the environment (such as stairs). The qualitative study also illustrated that the question on ramps was difficult to understand. Finally, it is unclear how thoroughly the fieldworkers were sensitised and trained on what to expect in a disability-accessible toilet. Direct observation by field workers who are not familiar with disability could lead to upwardly biased estimates.

More fundamentally, it is difficult to judge whether a school is wheelchair-accessible based on only two indicators. Importantly, there was no measurement of physical accessibility of the surrounding neighbourhood or transport to get to and from school. These aspects of broader accessibility of schools are emphasised in the draft version of the Washington Group Inclusive Education Module, where they are measured from the perspective of caregivers of children with disabilities who are not enrolled in school (that is, those that have not succeeded in overcoming the accessibility barriers)(Cappa et al., 2015). Such an approach should be tested in South Africa.

The SMS 2017 provides little useful information on the accessibility of learning materials. A question on the number of learners who are supported with adaptive learning and teaching support materials was included in the survey and was meant to serve as a proxy for provision of learning support to learners with high-level support needs. It has not been reported here as the results were difficult to interpret, in isolation of information on enrolment of learners with disabilities or high additional support needs in the school [29]. Without this information, it is not possible to determine whether a low proportion of schools providing these services is indicative of unmet need or to learners with disabilities not being present in the school.

While the importance of the debate about flexibility of the curriculum is fully acknowledged, given that Individual Support Plans are a central means of providing reasonable accommodation to learners with moderate or high-level additional support needs in South African policy, it seems sensible to monitor the number of learners with Individual Support Plans as a school-level enabler or a process indicator [30]. In fact, as a support plan would be

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[29] The question may not have been understood among educators who have not worked with learners with high-level support needs and was not defined in the questionnaire.

[30] As mentioned earlier, curriculum is not specifically addressed in this paper as it is a macro-level rather than school-level factor.

developed only once the SIAS process has progressed quite far, this may be a fairly accurate indicator of how far the SIAS process is being applied in a school. An alternative is to measure the allocation of concessions in the National Senior Certificate (school leaving) examination. If data on concessions granted could be incorporated with the demographic data collected as part of registration for the National Senior Certificate, this could prove a reliable indicator of disability inclusion processes in the senior years of secondary school. It would not provide much information about inclusion in earlier grades, and data would be biased towards those who have managed to remain in school up to the start of Grade 12. The allocation of concessions could be easily monitored from a national level as the national examination systems are well-suited for accurate measurement.

7.   Findings and conclusions

There is evidence that some implementation of inclusive education policies has occurred since 2011: school-based support team (SBST) coverage has improved and levels of support to these teams from the district has improved. However, availability of specialist services has not improved since 2011, despite the introduction of the Integrated School Health Programme in that time. The results suggest that screening is not well understood by educators and most feel they are unable to screen learners for visual, hearing or learning difficulties. Solving this challenge will require collaboration between the Integrated School Health Programme, district-based and school-based support teams, and investments in re-training of all three role-players, together, to build shared responsibility for this goal.

Disability support and teacher training to support disability inclusion are unevenly distributed across provinces. These provincial inequalities are likely related to uneven funding of inclusive education between provinces, as described previously by Budlender (2015). In South Africa, in general, the quality of education differs substantially between schools in wealthier areas (quintile 4 and 5) and schools in more impoverished areas (quintile 1 to 3 schools). For children with disabilities and those facing learning barriers, these results suggest that the province in which children live is an additional source of education inequality.

As of 2017, many ordinary schools in the impoverished (and more rural) provinces of South Africa are unlikely to be able to provide support required by children with disabilities (and those experiencing barriers to learning) to facilitate their effective education. Given the poor ability of schools to screen learners for learning difficulties and (less obvious) disabilities, it is likely that many learners who are currently enrolled are not identified as requiring additional support. This makes it highly unlikely that they are receiving the reasonable accommodation they require to enable full participation in learning.

The 2017 SMS has produced the first large sample nationally-representative set of data on teacher confidence in "dealing with learners with learning barriers". Teacher confidence has been shown to be strongly associated with prior training in special needs/learning barriers and the presence of the SBST in a school, except among Principals. Principals' confidence is driven by support from the district. The study provides evidence that, if equality of training, SBST coverage and district support could be achieved across provinces, inter-provincial

differences in teacher confidence could be eliminated in South Africa. Further research is needed to determine whether more confident teachers are more likely to have better attitudes towards inclusion, in general, and towards learners with disabilities, more specifically. This research should aim to identify parts of the schooling system where educators' attitudes have become more positive and identify the factors that have enabled this change.

School wealth quintile is not strongly associated with teachers' prior training on learning barriers or special education needs, teacher confidence or physical accessibility of schools, once other factors such as province, school size and the presence of a SBST are accounted for. This suggests that the implementation of inclusive education policy and rollout of training that has occurred, has been progressive in terms of its focus on poorer schools. The one important exception is the coverage of school-based support terms, which is much lower in quintile 1 schools than in all other schools.

This paper provides evidence of the further reforms which needs to be budgeted for to allow inclusion to flourish. One third of South African schools still need to form SBSTs and must be empowered and supported to do so. District support to these teams must be further prioritised. The health screening programmes offered by the Integrated School Health Programme must be further strengthened so that coverage can be improved. Collaboration between the health screening team and SBSTs must be strengthened, as part of improving educators' understanding of the screening process. Existing educator training programmes need to be extended to cover topics such as curriculum differentiation and setting of assessments for learners experiencing barriers to learning. More in-depth training is required to improve teachers' understanding of the screening process and the role of full-service schools. Further progress in improving accessibility of toilets is possible without an increase in the budget, but only if universal design is clearly prioritised in the infrastructure development programme. This will require sensitisation training among infrastructure planners. More information is needed on other aspects of disability accessibility in ordinary schools to inform budgeting further.

Many low- and middle-income countries are grappling with the challenge of reforming their education systems to become more disability-inclusive and on reporting meaningfully on their progress in this regard. Given the dearth of evidence on implementation of disability inclusion in schools in low- and middle-income countries, this survey adds importantly to the body of knowledge, firstly, on how far South Africa has come in the implementation of disability inclusion in schools and, secondly, on appropriate measurement of disability accessibility and provision of disability support in schools. This paper provides guidance to other countries in their efforts to develop effective indicators appropriate to their reality. Further it shares lessons learnt on questions educators found difficult to answer, errors in the questionnaire design, and methods of data triangulation that have cut down on socially desirable reporting. It is hoped that this will help other countries to anticipate and avoid challenges that South Africa has experienced.

Closer to home, this paper offers guidance to improve the School Monitoring Survey further before the next round. While the SMS 2017 adds greatly to the available evidence on the depth of implementation of disability support structures, teacher training for inclusive education and disability-accessibility schools, some key measurement gaps remain. While special schools (acting as resource centres) are one of the key support structures in inclusive education policy, the support provided by these structures is not measured in the SMS. This

type of support provided is not measured in any other quantitative study in South Africa. There is little clarity on how many special schools have been converted to resource centres and are actively serving learners enrolled in other schools. In qualitative research, teachers felt that special schools were a crucial support to ordinary schools, but were under-resourced making it difficult for them to extend support beyond their own learners (N. M. Nel et al., 2016). The SMS is a good vehicle to evaluate whether there was any collaboration between ordinary and special schools. For ordinary schools that received such support, it would be useful for this support to be evaluated by the SBST Coordinator.

The literature recommends that disability support should not be measured in isolation from disability enrolment (UNICEF Education Section, 2016). Unfortunately, enrolment of learners with high-level additional support needs or disabilities was not measured in SMS and it has not been possible to link these results with disability enrolment data from EMIS. This has made it difficult to interpret some results meaningfully. Linking the data in the future will allow more meaningful interpretation of the evidence. Some questions should only be posed to educators in schools who report enrolment of learners with high-level additional support needs.

Finally, the SMS does not evaluate whether the school has been able to identify or address any learning barriers in the school environment or classroom or teaching practices. Given that inclusive education involves a shift from focusing on learner deficits to focusing on making changes in the learning and physical environment to eliminate learning barriers, it is critical that this aspect is measured.

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Glossary of terms

CRPD	Convention on the Rights of Persons with Disabilities
DHIS	District Health Information System
IEP	Individual Education Plan
LMIC	Low- and middle-income country
LPM	Linear Probability Model
LSEN	Learners with Special Education Needs
SBST	School-based Support Team
SIAS	Screening, Identification, Assessment and Support
SMS	School Monitoring Survey
TALIS	Teaching and Learning in Schools
TIMSS	Trends in International Maths and Science Study

Appendix

Appendix Table 1: Core school-level indicators of the Pacific Indicators for Disability-Inclusive Education (2018)

Dimension	Core indicator
Presence & achievement	Number of regular schools enrolling children with disabilities.
	Number of children with disabilities completing primary school.
Physical environment & transport	% of schools with adapted infrastructure and materials for students with disabilities.
Early identification & services	Number of children with disabilities who are provided with relevant assistive devices & technologies.
Collaboration, shared responsibility & self-advocacy	Formal processes are established to systematically involve parents of children with disabilities in educational programmes.
Curriculum and assessment practices	Number of children with disabilities who sit exams with reasonable accommodations.[31]
Transition pathways	Number of children with disabilities graduating at an age-appropriate level from primary school and transitioning to secondary school.

Source: Sharma et al., 2018.

Appendix Table 2: Rate of instrument completion: School Monitoring Survey 2017.

Survey Instrument	Number of schools (%) completing instrument	Number of schools (%) where whole instrument is missing
Principal interview	1972 (98.6)	28 (1.4) [1]
Educator questionnaire	1966 (98.3)	34 (1.7) [2]
School observation	1979 (99.0)	21 (1.0)

Source: School Monitoring Survey 2017/18 Fieldwork Report

[1] Reasons for non-completion: Access to school denied (n=19); No-one available to complete questionnaire (n=6); Unwilling to complete this questionnaire (n=3)

[2] Access to school denied (n=19); No-one available to complete questionnaire (n=11); Unwilling to complete this questionnaire (n=4)

[31] Known as "concessions" in South Africa.

Appendix Table 3: Details of data triangulation performed.

Data field	Question	Triangulated against:	For which group of respondents?	% of sample (n) for which data could be triangulated:
Is the school Principal trained to identify & support learners with learning barriers?	Have you received any formal/informal training on identifying/supporting learners with learning barriers?	Similar question in Principal interview	Where the Principal completed the educator questionnaire	19% (n = 379)
Wheelchair-accessible toilets	School has one or more toilet(s) accessible for wheelchair use.	School observation	All schools	100% (n=1,978)
Wheelchair-accessible front entrance	Step-free front entrance	School observation	All schools	100% (n=1,978)
	If there are stairs at the front entrance, is there a ramp in good condition that is not too steep?	School observation	All schools	100% (n=1,978)
Number of teachers in a school who are trained in identifying/supporting learners with learning barriers	How many educators in your school have received training in identifying and supporting learners with learning barriers?	How many teachers in your schools have been trained (formally or informally) in identifying and supporting learners with learning barriers?	All Principals	19% (n = 379)
Full-service designation of the school	Is this a full-service school	Provincial reports to Inclusive Education Directorate, 2017	All schools	100% (n=1,978)
Self-rated ability to screen	% of learners in a school that is able to screen	DHIS Grade 1 screening coverage, Grade 8 screening coverage	All schools	100% (n=1,978)

DHIS = District Health Information System

Appendix Table 4: Effects of self-selection in educator questionnaire on estimates of proportion of Principals trained in identifying/supporting learners who experience learning barriers.

	All Principals	Principals who responded to educator questionnaire
Proportion of Principals with learning barrier training	0.48	0.62
	(0.02)	(0.04)
Sample	n=1891	n=381

Standard errors in parentheses

Appendix Table 5: Proportion of schools where Principal responded to educator questionnaire, by province.

Province	Principal is respondent to educator questionnaire
Western Cape	0.19
	(0.03)
Eastern Cape	0.12**
	(0.02)
Northern Cape	0.23
	(0.03)
Free State	0.08**
	(0.02)
KwaZulu-Natal	0.43**
	(0.03)
North West	0.21
	(0.03)
Gauteng	0.09**
	(0.02)
Mpumalanga	0.10**
	(0.02)
Limpopo	0.27
	(0.03)
South Africa	**0.19**
	(0.01)
Sample	1981

Standard errors in parentheses
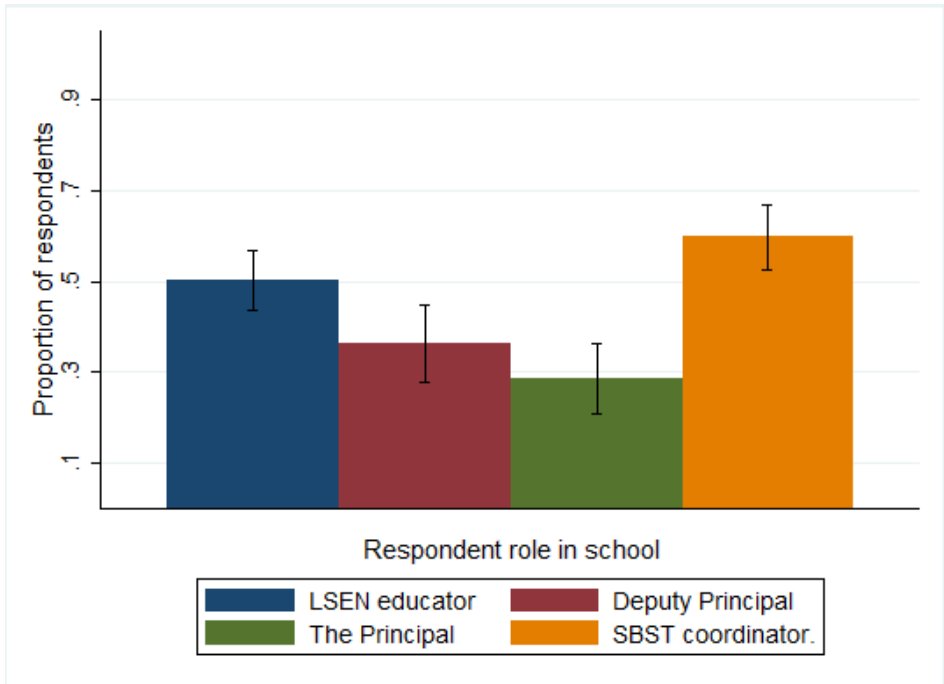
Appendix Figure 1: Proportion of educators with formal qualification in special or remedial education, by respondent role: 2017

Appendix Table 6: Correlation between training in identifying and supporting learners experiencing learning barriers and curriculum differentiation.

	Respondent received training: curriculum differentiation		
	All	Principal	Other
Respondent received training: identifying & supporting learners with learning barriers	0.566	0.674	0.517
Sample	1966	381	1585

Data source: SMS 2017 educator interview (weighted using school weights).

Column labelled "All" shows ρ for all respondents, col. labelled "Principal" shows ρ where Principal is respondent, col. labelled "Other" shows ρ where School-based Support Team Coordinator, LSEN Educator or Deputy Principal is respondent

Appendix Table 7: Probability that respondent has received training on setting assessments for learners who are experiencing barriers to learning.

	All	Principal	Other
Formal qualification in special or remedial education	0.169***	-0.054	0.217***
	(0.041)	(0.106)	(0.040)
Training on identifying/supporting learners with barriers to learning	0.387***	0.384***	0.372***
	(0.033)	(0.069)	(0.036)
Western Cape	0.187***	0.425***	0.139*
	(0.067)	(0.105)	(0.076)
Eastern Cape	-0.089	-0.109	-0.080
	(0.058)	(0.080)	(0.066)
Northern Cape	-0.001	0.132	-0.049
	(0.070)	(0.137)	(0.063)
Free State	0.120*	0.032	0.135**
	(0.070)	(0.206)	(0.069)
Kwa-Zulu Natal	0.058	0.078	0.095
	(0.068)	(0.101)	(0.077)
Gauteng	0.085	0.064	0.107
	(0.065)	(0.161)	(0.071)
Mpumalanga	0.013	-0.145	0.041
	(0.062)	(0.122)	(0.070)
Limpopo	-0.086	-0.154*	-0.044
	(0.053)	(0.089)	(0.062)
School is in wealth quintile 1-3	-0.001	-0.031	0.003
	(0.041)	(0.078)	(0.046)
Primary (or combined) school	0.066**	0.070	0.078**
	(0.028)	(0.053)	(0.031)
Constant	0.033	0.074	0.007
	(0.064)	(0.113)	(0.070)
R-squared	0.288	0.330	0.287
Sample	1943	1979	1945

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. School-level analysis (weighted). Col. (1) shows regression for all respondents, Col. (2) shows results where Principal is respondent, Col. (3) shows results where School-based Support Team Coordinator, LSEN Educator or Deputy Principal is respondent

Appendix Table 8: Probit regression: Educator is confident in dealing with learners with learning barriers.

	All	Principal	Other
School has SBST or similar structure	0.230	0.008	0.393**
	(0.158)	(0.289)	(0.178)
Formal qualification in special or remedial education	0.584***	0.780***	0.489***
	(0.124)	(0.298)	(0.124)
Training on curriculum differentiation	0.495***	0.412	0.482***
	(0.151)	(0.349)	(0.159)
Training on setting assessments for learners with barriers to learning	0.508***	0.271	0.576***
	(0.163)	(0.386)	(0.154)
District visit for purpose of supporting SBST	0.223	0.883***	-0.075
	(0.138)	(0.285)	(0.136)
Western Cape	0.023	-0.399	0.267
	(0.237)	(0.485)	(0.240)
Eastern Cape	-0.076	-1.474***	-0.068
	(0.209)	(0.439)	(0.231)
Northern Cape	-0.214	-0.109	-0.119
	(0.226)	(0.461)	(0.249)
Free State	0.074	-0.785	0.263
	(0.242)	(0.607)	(0.236)
KwaZulu-Natal	-0.121	0.040	-0.054
	(0.212)	(0.352)	(0.237)
Gauteng	-0.220	-0.861	-0.132
	(0.209)	(0.581)	(0.226)
Mpumalanga	-0.001	-1.064**	0.128
	(0.188)	(0.427)	(0.207)
Limpopo	0.302	0.393	0.364
	(0.213)	(0.384)	(0.258)
School is in wealth quintile 1-3	0.084	0.110	0.155
	(0.136)	(0.285)	(0.143)
Constant	-0.816***	-1.140**	-0.751***
	(0.246)	(0.455)	(0.286)
Sample	1916	372	1925

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Col. (1) shows regression for all respondents, Col. (2) shows results where Principal is respondent, Col. (3) shows results where School-based Support Team Coordinator, LSEN Educator or Deputy Principal is respondent. North West is omitted category for province.

Appendix Table 9: Proportion of learners enrolled in schools able to screen at least some learners for visual, hearing or learning difficulties.

Proportion of learners enrolled in a school that is:	
Able to screen at least some learners for visual difficulties	0.47
	(0.01)
Able to screen at least some learners for hearing difficulties	0.40
	(0.01)
Able to screen at least some learners for learning barriers	0.42
	(0.01)
Where SIAS forms completed for at least one learner in the school	0.47
	(0.01)
Sample	1966

Standard errors in parentheses. Data source: School Monitoring Survey 2017 LSEN (educator) Questionnaire (weighted)

Appendix Table 10: Probability that a school is able to screen learners' vision.

	Educator questionnaire		Principal questionnaire
	All	Other	
Western Cape	0.099	0.113	0.218***
	(0.078)	(0.090)	(0.076)
Eastern Cape	-0.110	-0.117	-0.033
	(0.073)	(0.086)	(0.071)
Northern Cape	-0.051	-0.066	0.033
	(0.078)	(0.079)	(0.077)
Free State	0.111	0.187*	0.118
	(0.101)	(0.096)	(0.080)
KwaZulu-Natal	0.017	0.032	0.109
	(0.072)	(0.082)	(0.072)
Gauteng	0.156**	0.151*	0.277***
	(0.071)	(0.082)	(0.064)
Mpumalanga	-0.109	-0.106	-0.049
	(0.066)	(0.074)	(0.066)
Limpopo	0.081	0.046	0.171**
	(0.079)	(0.094)	(0.080)
Respondent is trained [#]	0.132**	0.068	0.071
	(0.053)	(0.074)	(0.050)
School has a school-based support team	0.120**	0.080	0.222***
	(0.054)	(0.062)	(0.050)
Primary (or combined) school	0.205***	0.233***	0.185***
	(0.038)	(0.042)	(0.037)
School is in wealth quintile 1-3	0.001	0.012	-0.012
	(0.041)	(0.046)	(0.038)
Designated full-service school in 2017	0.100	0.072	0.152**
	(0.066)	(0.068)	(0.065)
Total schools in municipal district	0.000**	0.000**	0.000***
	(0.000)	(0.000)	(0.000)
Constant	-0.004	0.055	-0.103
	(0.085)	(0.107)	(0.082)
R-squared	0.109	0.093	0.146
Sample	1924	1930	1938

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. # has either a formal qualification in special needs or remedial teaching or any learning barriers training. Columns 1-2 show results from the educator questionnaire, Col. 3 shows results for the Principal questionnaire. Column 1 shows regression for all respondents to educator questionnaire, Col.2 shows results where SBST Coordinator, LSEN Educator or Deputy Principal is respondent.

Appendix Table 11: Probability that a school is able to screen at least some learners for hearing difficulties.

	Educator questionnaire		Principal questionnaire
	All	Other	
Western Cape	0.136*	0.177**	0.152*
	(0.077)	(0.089)	(0.078)
Eastern Cape	-0.060	-0.047	-0.129*
	(0.071)	(0.084)	(0.071)
Northern Cape	-0.013	-0.036	-0.016
	(0.077)	(0.076)	(0.079)
Free State	0.114	0.198*	0.096
	(0.109)	(0.108)	(0.113)
KwaZulu-Natal	0.070	0.096	0.034
	(0.071)	(0.080)	(0.072)
Gauteng	0.230***	0.240***	0.244***
	(0.071)	(0.081)	(0.066)
Mpumalanga	-0.102	-0.095	-0.127*
	(0.064)	(0.070)	(0.066)
Limpopo	0.125	0.106	0.105
	(0.079)	(0.092)	(0.079)
Respondent is trained #	0.076	0.006	0.046
	(0.053)	(0.075)	(0.050)
School has a school-based Support Team	0.139***	0.112*	0.175***
	(0.054)	(0.061)	(0.052)
Primary (or combined) school	0.240***	0.261***	0.211***
	(0.037)	(0.042)	(0.037)
School is in wealth quintile 1-3	0.054	0.064	0.057
	(0.041)	(0.046)	(0.040)
Designated full-service school in 2017	0.038	0.016	0.116*
	(0.067)	(0.069)	(0.068)
Total schools in municipal district	0.000*	0.000*	0.000**
	(0.000)	(0.000)	(0.000)
Constant	-0.117	-0.071	-0.074
	(0.085)	(0.106)	(0.084)
R-squared	0.112	0.101	0.128
Sample	1924	1930	1938

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. # has either a formal qualification in special needs or remedial teaching or any learning barriers training. Columns 1-2 show results from the educator questionnaire, Col. 3 shows results for the Principal questionnaire. Column 1 shows regression for all respondents to educator questionnaire, Col. 2 shows results where SBST Coordinator, LSEN Educator or Deputy Principal is respondent

Appendix Table 12: Correlation coefficients: Self-rated ability to screen and support from district.

District support provided in 2017	School able to screen:		
	Vision	Hearing	Learning barriers
School visited by District-based support team/ district specialist/ health official	0.17	0.15	0.16
Sample	1924	1924	1924
District provided support to SBST at support visit	0.16	0.15	0.18
Sample	1929	1929	1929

Data source: SMS 2017 Principal interview (weighted using school weights)

Where SBST = School-based support team