Data-informed Instructional Leadership: Improving the Instructional Program in South African Primary Schools

R.N. (Nylon) Marishane

*Department of Education Management and Policy Studies, Faculty of Education,
Groenkloof Campus, University of Pretoria, 0002 South Africa
E-mail: nylon.marishane@up.ac.za*

ABSTRACT Managing an instructional program is recognized as constituting a major area of focus for successful school leadership. Linked to this recognition is the acknowledgement of the importance of the school principal in improving performance in this area and accounting for decisions made in the process. To improve learner performance and strengthen accountability, principals are encouraged to turn to data. This enables them to examine performance, generate informed decisions and plan for sustainable improvement. In this study, current school performance and leadership practices in South Africa are examined against a literature background. Based on a qualitative study, this paper examines specifically how principals in South African primary schools use data to manage the instructional program. The paper shows challenges which principals face in improving learner performance without the capacity for effective data use. One key finding is that school leaders lack capacity to create a culture of collaborative enquiry in schools.

INTRODUCTION

Schools in many parts of the world today are experiencing a growing demand for accountability for educational outcomes and provision of tangible evidence for such accountability. School leaders in particular, are called upon to account for learner performance on national assessments (Figlio and Loeb 2011). Desirable national learner performance standards are set and school leaders are expected to explain why the learners' achievement is below or above the standards. To meet this demand, they are required to create data-driven instructional systems guiding teaching and learning practices within their schools (Halverson et al. 2005). Policymakers and a wide range of stakeholders are now more concerned about what comes out rather than what goes into the school, thus obliging school leaders to draw their attention towards their schools' internal processes. These stakeholders demand reports on curriculum processes and educational results and stress concrete evidence that goes far beyond 'widespread trust in the professional competence of educators' (Møller 2007:2).

Stakeholders demand accountability from school leaders, thus reinforcing the call for a match between the money invested in schools and the results achieved (Boser 2011). This represents a shift from talk about educational inputs, which has dominated debates on school improvement for the greater part of the last century to an emerging interest in educational outcomes (Hanushek and Woessmann 2011). Such a shift gives substance to the question of how school leadership can ensure sustainable improvements in the core business of schooling to help and account for student learning. The review of literature on school leadership and improvement presents various responses to this question. One package of response to this question is the research-based view that school improvement emerges from a good mix of the school leader's core practices (Leithwood et al. 2006) combined with the view that places a strong emphasis on the school leader's knowledge of and use of data in pursuance of such improvement (Datnow et al. 2007). What this suggests in simple terms is that school principals as instructional leaders should be data-informed and turn to data as valuable decision-making instruments in their effort to bring about improvement.

Review of Literature on Data-informed School Leadership for School Improvement

Three questions guided the researcher's review of literature on the relationship between school leadership, data and school improvement. The first question relates to the conceptual analysis of data as they relate to school improvement. The second question relates to examining the link between school improvement,

instructional leadership, data and instructional programs. The last question enquires about lessons derived from instructional leaders' use of data in performance-driven schools.

What is Known About Data and Why Does it Matter for School Improvement?

The concept 'data' is broadly defined as any piece of information that assists educators to gain better knowledge about their learners (Jimerson and Wayman 2012). It refers to any qualitative or quantitative source of information purposefully and systematically collected, organized, analyzed, interpreted and used in making decisions about organizational and instructional improvement. Given that schools are by their nature complex organizations with multiple data at their disposal (Marishane 2011), the classification of the data as they relate to the core business of schooling is important. The following are examples of the types of data relating directly to the core business of schooling cited frequently in school improvement literature (Bernhardt, 2004; Wayman et al. 2004; Yunas and Iqbal 2013):

- *Learner achievement data*: This category includes data on continuous assessment (CASS), learners' class work and homework projects, and the Annual National Assessment (ANA).
- *Stakeholder opinion/perception data*: This category covers data on perceptions of parents, teachers, Education Department, donors and other schools regarding school performance.
- *Learning program/process data*: This category includes data on curriculum alignment, enrichment programs and subject combination.
- *Demographic data:* The category covers grade-to-grade learner mobility, attendance, gender, socio-economic backgrounds and enrolment in programs (Mathematics, Language and Science enrichment programs) addressing special educational needs.

Other researchers would prefer to classify data in terms of how they are used to inform practice and improve teaching and learning (Skalski and Romero 2011). In this manner, data is classified as *formative data* and *summative data.* Formative data includes data gathered regularly during teaching and learning to monitor each learner's progress, identify gaps in learning and develop intervention strategies. Summative data refers to data used to measure the impact of intervention strategies on learner performance and to develop remedial strategies.

The importance of using data for school improvement is not a new development, but an issue that has been around since way back in 2000 (The Wallace Foundation 2013). It is a subject matter that continues to dominate contemporary debates on school improvement. Research outlines various ways in which data can contribute to school improvement. A few examples can be cited in this regard. First, data enables instructional leaders to respond to external demands for accountability for the learners' results (Kellaghan et al. 2009). Second, data is a valuable tool used in school- and classroom-based decision-making to enhance the learners' academic experiences and achievement (Wayman et al. 2004). Decision-making here may include matters relating to learning programs, instructional strategies and resource allocations. Knowledge of data, particularly data relating to student learning, and the use of data as an instrument that facilitates decision-making, has the potential to enhance accountability in schools. Third, data assists in prompt identification of the learners' strengths and weaknesses (Jimerson and Wayman 2012). Such identification helps in resolving learning problems before they escalate and avoiding decline in learner performance. Lastly, data informs instructional practices in schools (Wayman et al. 2012). Such practices include design and deployment of instructional strategies for addressing weaknesses identified in the course of implementing an instructional program and strengthening and sustaining learner achievement.

How Does School Improvement Link with Instructional Leadership, Data and Instructional Program?

Review of literature shows school improvement as a function (*f*) of leadership, data and instructional (teaching, learning and assessment) program, which can be illustrated by means of the following simple mathematical formula, similar to the one Leithwood et al. (2006:32) used in their study on the influence of successful leadership on pupil learning:

$Ij = f(Lj, Dj, Pj)$

Where,

I represents *school improvement* articulated through learner achievement

L represents *instructional leadership* or its improved versions known as 'Leadership for learning' and 'Learning-focused leadership' (Hallinger 2012)

D represents *data use*

P represents the *instructional program*

A simple argument presented through the interplay of the variables in the formula is that school improvement occurs when an instructional leader effectively uses data to make decisions that support the instructional program. This argument is grounded on available empirical evidence and three examples can be cited in this regard. The first example, derived from a *Thematic Review of School Leadership* conducted in 22 OECD countries (Pont et al. 2008), found that school leadership is responsible for promoting 'data-wise' leadership by distributing assessment and accountability tasks to people in the school who are able to use data in designing appropriate improvement strategies. The second example is a comparative case study into data-driven instructional decision-making conducted in four urban high schools and districts in the United States, which has found that school leaders appreciate the importance of 'building a data-driven decision-making culture that used data to drive instructional decisions' (Datnow et al. 2008:11). The last example is a recent case study of high-performing schools (Datnow et al. 2007), which has found that these schools, though operating in different contexts, share similarities in respect of how their leaders used data.

The importance of using data, as highlighted in the above-mentioned case studies, brings one to the new dimension relating to one's understanding of the concept 'instructional leader' and its derivative 'data-informed instructional leader'. An instructional leadership prioritizes teaching and learning (Bush 2007). In other words, instructional leaders focus their attention on curriculum and instructional matters that directly affect learner achievement. Data on learner achievement is one of these matters (Cotton 2003). By extension, a data-informed instructional leader may be defined as an instructional leader who is both data-literate and data-competent. A data-literate leader is able to develop capacities for effective use of data (Knapp et al. 2006). In other words, *data literacy* implies that a leader is capable of asking and answering questions relating to data collection, analysis and interpretation, as Hamilton et al. (2009) suggest. *Data competency* extends further beyond the capacity to ask and answer the right questions about data. It also covers acquisition of skills in asking the right questions, answering them correctly and acting upon the answers (Protheroe 2009). It includes acquisition of skills needed in different contexts for identifying and accessing relevant data (qualitative and quantitative), attaching shared meaning to data, developing effective strategies for supporting teachers in the use of data to improve the instructional (teaching, learning and assessment) program and accounting to stakeholders for the results emanating from their decisions.

What Lessons are Learnt From Instructional Leaders' Use of Data in Performance-driven Schools?

An exhaustive international review of literature on successful school leadership (Leithwood et al. 2004; Leithwood and Jantzi 2005; Leithwood and Riehl 2005; Leithwood et al. 2006) presents such leadership as manifesting four tangible core practices that apply in all contexts, namely, setting direction, developing people, redesigning the organization, and managing the instructional (teaching and learning) program. Similarly, a large body of research into the use of data in performance-driven schools (Copland 2002; Schmoker 2004; Wayman 2005; Wayman et al. 2005; Lous et al. 2010; Wayman et al. 2012), shows that data-informed leadership practices in these schools correspond with that depicted in successful school leadership studies. There are four major leadership practices that research has identified in this area, namely, building a culture of collaborative enquiry, building teacher capacity for data use, establishing data-informed organizational culture, and monitoring the use of data for continuous improvement. These practices are explained briefly as follows.

Setting direction: Building a culture of collaborative enquiry: This practice includes setting shared goals and visions and fostering collective commitment to them, setting the tone by serving as an example of how best data can be

used, setting standards for measuring learner achievement and fostering collective agreement on how to meet them, setting clear measures for monitoring teacher and learner performance, and creating a sense of purpose and raising expectations for data use.

Developing people: Building teacher capacity for data use: The practice covers such activities as building collaborative data teams, establishing accountability systems in the school, creating professional development opportunities aimed at developing strategies for effective data management, engaging teachers in the use of data and equipping them with user-friendly technology (computer data collection system), and selecting program materials and assessment instruments

Redesigning the organization: Establishing data-informed organizational culture: This practice includes changing the teachers' mindset, transforming them from being passive implementers (compliance-driven) to becoming active researchers (enquiry-motivated), and establishing a culture of data use and continuous improvement, ensuring that data use is embedded in their daily instructional practices

Managing instructional program: Monitoring the use of data for continuous improvement: The practice covers such activities as supervising teachers and ensuring that they prioritize student data to guide the instructional program, and providing resources for capturing, storing and analyzing data on teaching, learning and assessment.

Aim of Study

This study aims at examining how principals as instructional leaders in South African primary schools use data to inform management of the instructional program in their schools and the challenges they experience in the process. By studying current school performance and leadership practices in South Africa against the background of studies conducted in other countries, the paper presents recommendations for improved practices derived from literature. In order to achieve this aim, the following research questions are raised:

1. What are research-based best practices regarding instructional leaders' use of data relating to the instructional program to improve performance?

2. How do principals in the sampled primary schools apply these practices in their management of the instructional program?

3. What challenges do principals experience in the process?

METHODOLOGY

This qualitative study was carried out in eight purposefully selected rural South African primary schools drawn from four out of five regions of Limpopo Province. It involved in-depth interviews with eight primary school principals. Two principals were selected from each of the four regions. To protect their identity, participants were designated as Principals A, B, C, D, E, F, G and H. For data collection, an interview guide was used. The interview guide contained questions grouped into four data-informed leadership themes, namely, *building a culture of collaborative enquiry, building teacher capacity for data use, establishing data-informed organizational culture of practice* and *managing instructional programme.* The study was conducted against the background of three important developments. The first development was the national concern about poor performance of primary school learners in Mathematics, Science and Languages, which is a subject dominating the public media and scientific discourse (Meier 2011; Monama 2011; Bloch 2012; Spaull 2013). The second development was the introduction of the new Curriculum and Assessment Policy Statement (CAPS), and the last one was the introduction of a South African School Administration and Management System (SASAMS), which is a computer application used for collecting data in schools. Data analysis was carried out using Braun and Clarke's (2006) thematic analysis

The study began with a synoptic review of literature on data, instructional leadership and the connection between the two in relation to the instructional program. This was done to answer the first research question. The literature review was subsequently followed by a qualitative empirical examination of the last two research questions against the background of the first research question.

RESULTS

The following are the results of the study presented here in the form of the four themes

that covered the interview sessions, namely, *building a culture of collaborative enquiry, building teacher capacity for data use, establishing data-driven organizational culture of practice, and managing an instructional program:*

Building a Culture of Collaborative Enquiry

This theme covered interview questions relating to the alignment of data use with the school vision, discussing learner achievement goals with staff and developing common strategies to achieve national standards. It emerged from the interviews that all the schools visited had written mission and vision statements as a result of a once-off training by the Department of Education in this area. The common problem the schools shared was how to translate their statements into measurable objectives using learner achievement data as instruments to enable this undertaking. Principal A explained:

Well, we hear that our learners, compared to those in urban areas, perform dismally in Math, Science and Languages, but in all the workshops my teachers have attended in the circuit so far no mention was made of performance targets we have to reach as a circuit. Remember, that we are in a rural area and our schools lack resources like libraries and laboratories, let alone math equipment like counters and so on. So, it becomes difficult for us to set our own targets in the absence of the circuit targets and the necessary resources.

Lack of performance targets appeared to be prevalent is the schools visited. Asked about how the steps taken to make up for the lack of targets, Principal H said:

What I continually tell my teachers is to work hard and improvise. This is the language they hear from our circuit meetings and workshops.

While Principal C and Principal F stated that they always discussed learners' examination results with staff members, coming up with remedial action was a challenge. Principal F explained:

Because we lack resources, we lack improvement strategies. When I look at the CASS (continuous assessment) schedules my heart bleeds.

Building Teacher Capacity for Data Use

It emerged during the interviews that not all teachers in the schools received training on data handling. According to the participants, the Pro-

vincial Department of Education (PED) organized workshops, first at district level and later at circuit level to train teachers on the use of the SASAMS where only one teacher per school received training. School principals on the other hand, attended a once-off orientation workshop session aimed at introducing them to the new data collection system. The main focus of the workshop, according to Principal E, was more on *"informing school principals about the importance of the system and their role in supplying data generated through it to the PED at stipulated times, than on a detailed technical operations of the system"*. Lack of skills in team building combined with lack of training in SASAMS, in Principal D's view, created problems. The principal presented two common problems experienced in this regard. The first problem was that knowledge of the use of the system was not cascaded to other staff members. The second problem was that principals experienced challenges relating to building data teams. These problems, according to all the participants, resulted in a heavy reliance on information presented to them by the trained teachers. This created problems for school principals when a trained teacher left the school due to promotion or redeployment, creating a void to be filled by a new untrained teacher. Principal B expressed the challenges she experienced in this regard:

A sudden departure of my staff member to a new school left me with no option but to appoint a new teacher and take her to another school to be trained by a trained teacher there. My newly trained teacher is a struggler and like other members of staff, she is not computer-literate. As a result, she supplies me with incorrect data, which is only discovered when I make a submission to the Circuit Office. The system is good, but we need training.

On how principals try to develop staff on the use of data, Principal D remarked, *"How can you develop your teachers while you are not developed yourself and how do you motivate them?"*

Establishing Data-driven Organizational Culture of Practice

During the interviews it was found that principals regarded all data as important decision-making enablers. Despite this, two shortcomings were noted. First, they admitted that they

did not do enough to communicate the importance of data to their staff members and ensure that working with data became a critical part of daily teaching and learning practice. Second, they tended to elevate the importance of some data over others. For example, all the schools whose principals were interviewed did not have a common system of recording data relating to a student's learning problems. This gave rise to a selective use of data, implying that the importance of data was not infused in the teachers' daily instructional practices, but rather on learner assessment. The result was to give more attention to data that the PED frequently requested from schools such as data on assessments (CASS and ANA) and school attendance. Principal A justified such practice in the following words:

I understand the importance of data relating to everything teachers do in the classroom, but the Department does not require that information. They only need data on achievement and not on performance. For example, they will not ask for data relating to teaching and learning materials, because they understand that such data once recorded on the system (SASASM), it becomes public and exposes the Department's inability to supply sufficient resources.

Managing Instructional Program

Though all the participants in the interview recognized the importance of using student data to monitor the instructional material (teaching and learning), they complained about their lack of time to carry out this task, because of administrative workload. The greater share of time, according to them, is taken by visits to the circuit offices for submissions and frequent cluster meetings organized by the circuit for principals. This, according to the participants, makes it difficult for them to visit classrooms, to organize staff meetings at which teaching and learning data is shared and brainstormed and improvement strategies are discussed with subject teachers. As a result, data relating to classroom practices, the quality and quantity of classroom exercises, performance of learners in written work and their learning problems are neither captured nor required by the Department. Principal G passed the following remarks:

The Department seems to be more interested in what comes out of the classroom than on what goes on in the classroom as shown by their fascination with the submission of assessment data. So, the emphasis is on achievement and not performance. This affects my plan for class visits, because when you try to plan for such visit, you are called to a meeting at short notice through an SMS and your plan fails.

DISCUSSION

Since this small-scale study was qualitative in nature, its results cannot be generalized. However, its findings shed light on how primary school principals in some parts of South Africa use data in their schools. The discussion in the following paragraphs focuses on how the results from the study relate to literature on the subject of enquiry.

Assisting School Principals in Generating Holistic View of Data

Emphasis on achievement (*summative*) data at the expense of performance (*formative*) data shows that the provincial education department trusts the professional competence of teachers in effective delivery of instruction, something that existing studies warn against (Møller 2007:2). Such confidence is betrayed by actual practices manifested by documented data on poor achievement of primary school learners in key subjects (Spaull 2013), which has become a matter of public knowledge in South Africa. The Department of Basic Education's emphasis on the schools' generation and submission of learner achievement data than performance data, as the interviews shows, creates an impression among teachers and principals that data relating to classroom teaching and learning is of secondary importance. For this reason, data on learning problems and how children learn takes a back stage.

Developing Capacity for Data Use

Studies on successful school leadership emphasizes the importance of developing teachers and specifically stress that teachers perform to the best of their abilities if they are motivated and have the necessary skills to carry out tasks allocated to them in their schools (Leithwood et

al. 2006:32). What the study presents here is a lack of capacity among principals to develop teachers in the area of data handling since they are neither trained nor motivated to do this themselves. This lack of capacity does not bode well for improvement, because for teachers to teach effectively in the classroom, they need to have knowledge on how to gather, organize, analyze and use learners' data to improve their performance and enhance their achievement, rather than passing raw data to the Department for purposes of analysis, decision-making and planning at that higher level. Without the necessary capacity in the form of skills, knowledge and the ability to work with data on the part of educators (teachers and their principals), it will be difficult for learner achievement to improve. This assertion is informed by one model applied to explain performance in the workplace, which states that the level of people's performance depends on the combination of factors such as motivation, abilities and the situation in which people work (Leithwood et al. 2006).

Using Data to Improve Instructional Practice

What drives the current focus on data-informed leadership in performance-driven schools is the use of data to improve instruction. In this study, however, school principals appear to be detached from the responsibility of engaging with data to support their teaching staff. Their role is limited to the collection of data and submission thereof to the Department for the use by the latter in making decisions at a higher level. This creates a sense that the school principals, though acknowledging the importance of data, see management of data as a separate, additional responsibility rather than a key function that should be infused into the management of teaching and learning program. It is for this reason that principals only turn to data when such data is needed. In other words, they see data in accountability terms. This is confirmed by other studies (Murray 2014). What this suggests in the current study is that schools have not yet established a data-driven culture where data is imbedded in daily practices. A data-driven culture requires vision, guidance and commitment of both leadership and staff (Mills 2011). Without the establishment and maintenance of this kind of culture in schools, it is unlikely for data to be used to improve performance.

Putting Data at the Center of Instructional Leadership

Supervising staff and monitoring the instructional (teaching and learning) program are key responsibilities of instructional leaders. Studies (Johnson et al. 2011) show that principals in high-performing schools regularly visit classrooms to observe learner engagement, classroom atmosphere, climate and tone. This enables the principals to gather qualitative data on teaching and learning for subsequent decision-making and planning. For school principals, as the study shows, to be immersed in administrative work and disengage from supervising teachers and monitoring what happens in the classroom by focusing on data generated there, will unlikely motivate staff. In addition, lack of capacity on the part of school principal to work with data makes supporting teachers difficult.

CONCLUSION

Proceeding against the background of literature review, this study has examined how primary school principals in South African make use of data to inform their decisions in teaching and learning. Such a review presents an evidence-based argument that effective use of data to support the instructional program is a critical aspect of school improvement. Successful school leaders according to school improvement literature, focus their attention on developing staff and encouraging them to make use of data to support learners and improve their chances of academic achievement. This happens in the school environment where data-informed culture is established and infused in teachers' and school leaders' daily practices. As this study has found, school principals as instructional leaders experience challenges when coming to the critical issue of dealing with data. These challenges can be addressed through capacity building initiatives by the Department of Basic Education aimed at providing principals with the necessary skills needed for working with data. Principals' knowledge of data and their creation of data-informed culture in schools strengthen their basic professional practice as instructional leaders.

RECOMMENDATIONS

In view of the results of this study, one would present several recommendations. These rec-

ommendations cover aspects such as organizational culture, capacity building and advocacy and change of attitudes.

Organizational Culture

There is a need for the Department of Basic Education in South Africa to encourage a move towards a data-informed school organizational culture of practice where every instructional decision and action taken by both teachers and school leaders is based on the available data. Equal emphasis needs to be placed on both performance data and achievement data to close the existing gap between the two.

Capacity Building

School principals as instructional leaders need to be actively involved in data management and need capacity in the form of knowledge and skills necessary for working with data. As people working with teachers, they can provide leadership by infusing a sense of collaborative enquiry among staff members if they have the necessary capacity to do so. This requires training on such data management systems as *SASAMS* targeted for school principals to ensure that data gathered through such systems inform their instructional leadership practices.

Advocacy and Change of Attitudes

Lastly, there is a need for advocacy and change of attitude in the use of data among principals. The fact that school principals in successful schools serve actively as instructional leaders who supervise teachers and monitor their work, does not suggest their personal presence in the class as data collection instruments all the time the need for data arises. What it suggests is that principals need to exercise monitoring and carry out supervision by focusing on data that teachers generate and occasionally visit classrooms to verify the authenticity of the data. In other words, instructional leaders use data as a means of communicating with the classroom on continuous basis.

REFERENCES

Benhardt V 2004. *Data Analysis for Comprehensive School Improvement.* 2nd Edition. Larchmont, NY: Eye on Education.

Boser U 2011. *Return on Educational Investment: A District-by-District Evaluation of U.S. Educational Productivity.* Washington, DC: Centre for American Progress.

Braun V, Clarke V 2006.Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3: 77-101.

Bush T 2007. Educational leadership and management: Theory, policy and practice. *South African Journal of Education,* 27(3): 391-406.

Copland MA 2002. *Leadership Enquiry: Building and Sustaining Capacity for School Improvement in the Bay Area School Reform Collaborative.* San Francisco, CA: Centre for Research on the Context of Teaching.

Cotton K 2003. *Principals and Student Achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.

Datnow A, Park V, Wohlstetter P 2007. *Achieving with Data: How High-performing School Systems Use Data to Improve Instruction for Elementary Students.* Rossier School of Education, Center on Educational Governance. Los Angeles: University of Southern California.

Datnow A, Park V, Kennedy B 2008. *Acting on Data: How Urban High Schools Use Data to Improve Instruction.* Centre on Educational Governance. USA: University of Southern California.

Hallinger P 2012. Leadership for 21st Century Schools: From Instructional Leadership to Leadership for Learning. *Public Lecture*, Ministry of Education Rome, Italy October 4, 2012.

Halverson R Grigg J, Prichett R, Thomas C 2005. The New Instructional Leadership: Creating Data-driven Instructional Systems in Schools. *Paper prepared for the Annual Meeting of the National Council of Professors of Educational Administration* in July 2005 in University of Wisconsin-Madison, Washington, D.C. Madison, WI.

Hamilton L, Halverson R, Jackson S, Mandinach E, Supovitz J, Wayman J 2009. Using Student Achievement Data to Support Instructional Decision Making (NCEE 2009-4067). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. From <http://ies.ed.gov/ncee/wwc/publications/practiceguides/.> (Retrieved on 20 February 2013).

Hanushek E, Woessmann L 2011. How much do educational outcomes matter in OECD countries? *Economic Policy,* 67(July): 1-65.

Jimerson JB, Wayman JC 2012. Branding Educational Data Use through Professional Learning: Findings from a Study in Three School Districts. *Paper presented at the 2012 Annual Meeting of the American Educational Research Association*, Vancouver, Canada on 13-17 April 2012.

Johnson JF, Uline CL, Perez LG 2011. Expert noticing and principals of high-performing urban schools. *Journal of Education for Students Placed at Risk*, 16(2): 122-136.

Kellaghan T, Greaney V, Murray TS 2009. *Using the Results of National Assessment of Educational Achievement.* Washington: DC: The World Bank.

Knapp MS, Swinnerton JA, Copland MA, Monpas-Huber J 2006. *Data-informed Leadership in Education.* Center for the Study of Teaching and Policy. Seattle, WA: University of Washington.

2

0

0 R.N. (NYLON) MARISHANE

200

Leithwood K, Day C, Sammons P, Harris A, Hopkins D 2006. Successful School Leadership: What it is and How it Influences Pupil Learning. *Research Report No.* 800. Nottingham: University of Nottingham.

Lous KS, Leithwood K, Wahlstrom K, Anderson SE 2010. *Investigating the Links to Improved Student Learning: Final Report of Research Findings.* Center for Applied Research and Educational Improvement. USA: University of Minnesota.

Marishane RN 2011. *School Leadership in a Changing Context: A Case for School-based Management.* Pretoria: Van Schaik Publishers.

McREL 2001. *Leadership for School Improvement.* Aurora, CO: McREL.

Mills, LB 2011. Creating a Data-driven Culture: Leadership Matters. SAS Institute Inc. From<http://www.sas.com/resources/whitepaper/wp_27579.pdf> (Retrieved on 29 November 2014).

Møller J 2007. School Leadership and Accountability: Moving Beyond Standardization of Practice. *Paper presented at the 20th Annual World ICSEI Congress,* in Portoro•, Slovenia on 3-6 January 2007.

Murray J 2014. Critical issues facing school leaders concerning data-informed decision-making. *The Professional Educator,* 38(1): 1-8.

Protheroe N 2009. Improving Teaching and Learning with Data-based Decisions: Asking the Right Questions and Acting on the Answers. Educational Research Services. From <www.ers.org/spectrum/sum01a.htm> (Retrieved on 30 November 2013).

Schmoker M 2004. Tipping point: From feckless reform to substantive instructional improvement. *Phi Delta Kappan,* 85: 424-432.

Spaull N 2013. South African Education Crisis: The Quality of Education in South Africa 1994-2011. *Report Commissioned by CDE,* October 2013. Johannesburg: Centre for Development and Enterprise.

Wayman JC, Spring SD, Lemke, MA, Lehr MD 2012. Using Data to Inform Practice: Effective Principal Leadership Strategies. *Paper presented at the 2012 Annual Meeting of the American Educational Research Association*, Vancouver, Canada on 13-17 April 2012.

Wayman JC, Midgley S, Stringfield S 2005. Collaborative Teams to Support Data-based Decision-making and Instructional Improvement. *Paper presented at the 2005 Annual Meeting of the American Educational Research Association,* Montreal, Canada on 11-15 April 2005.

Wayman JC, Stringfield S, Yakimowski M 2004. *Software Enabling School Improvement Through Analysis of Student Data.* Baltimore, MD: CRESPAR/Johns Hopkins University.

Wayman JC 2005. Involving teachers in data-decision-making: Using computer data system to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk,* 10(3): 295-308.

Yunas M, Iqbal M 2013. Dimensions of the instructional leadership role of principal. *Interdisciplinary Journal of Contemporary Research in Business,* 4(10): 629-627.