

Improving Accountability Models in  
Public Education: Applying Logic  
Models of Performance Management

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## ABSTRACT

Within the field of education administration and education policy a substantial body of literature has accumulated on the issue of accountability, especially as manifest in performance measurement and performance management approaches. Most of the effort in these areas has focused on the “high stakes” approach to accountability, as exemplified by the No Child Left Behind legislation in the United States. While this approach to accountability in the publicly funded K-12 educational system has had a dramatic impact, the failings of the approach as planning and evaluation methods are increasingly apparent.

In this paper, the authors examine the current use of accountability framework models as they relate to publicly funded education in North America and compare them to more complex models developed in the field of public administration and public policy. They find that, in general, the models employed in public K-12 education are overly narrow in perspective, as compared to public sector accountability frameworks such as the logic model. As a result, educational models appear too restrictive regarding the nature of accountability they engender within the system. These models also are unduly limiting in their likely effectiveness in supporting research and the development of educational method and policies which support broad social goals. This unnecessary limitation is especially clear in examination of the available literature from other social sciences indicating a strong linkage between education effort and social outcomes.

## EDUCATIONAL ACCOUNTABILITY: THE NEED FOR A BROADER PERSPECTIVE

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“Accountability is at the heart of governance within democratic societies” (Thomas 1998, 348). In an era characterized by increasing concern about the responsiveness, effectiveness, and honesty of institutional structures, in the public or private sector, this comment rings true. Whether dealing with the outcomes of the Enron fiasco or the Gomery Commission, examples of employee malfeasance within the public service, or perceived failures by publicly funded K-12 education, citizens increasingly both expect and demand action that ensures appropriate accountability mechanisms are in place.

Despite this demand for increased accountability, the nature of these public expectations is less clear in terms of what exactly is meant by increased accountability and, within the public sector at least, how these seemingly unassailable goals are to be achieved.

From a program manager’s perspective, Robert Behn provides a poignant perspective regarding accountability: “These accountability *holdees* have a very clear picture of what being held accountable means – to them personally...two things can happen: when they do something good, nothing happens. But when they screw up, all hell can break loose” (Behn 2001, 3). This comment aptly describes narrow definitions of accountability that often seem unduly focused on determining responsibility for failures or mistakes. Kearns (1996, 35-36) provides a more useful framework for this discussion, referring to “narrow” definitions of accountability, preferring a “broad” definition which “encourage[s] us to consider a more diverse set of performance criteria – something beyond mere compliance and reporting. Also, these definitions help us pose additional questions to help clarify those criteria” (39). Thomas (1998) and Darling-Hammond (2004) support this perspective, arguing for broader notions of accountability from which to assess the current situation and the need for change.

Kearns (1996, 63) suggests that a strategic management approach incorporating a strategic plan for accountability is critical for success. Kearns (1996, 169) further suggests that this strategic approach requires an anticipation of legal trends, the ability to work successfully with stakeholders, and the sustained commitment of resources to develop accountability systems that are objective, valid, and reliable. Within the public sector, advocates of New Public Management (NPM) champion this drive for responsive, accountable governance. Robert Behn (1998) comments that NPM has challenged traditional practices in public administration:

Their argument is simple: The traditional method for organizing the executive branch of government is too cumbersome, too bureaucratic, too inefficient, too unresponsive, and too unproductive. It does not give us the results we want from government. And today, citizens expect government to produce results. (131)

Peach (2004) reinforces this perspective, indicating that, “The public and the politicians they elect to govern are increasingly seeking ways to improve, simultaneously, the effectiveness, efficiency, equity, responsiveness, and accountability of government” (1).

This demand for results-based, public sector accountability applies equally to publicly funded K-12 education. Levesque (2004) comments that within American public education, these concerns have resulted in the passage of the *No Child Left Behind Act* (NCLB), which, in the name of educational accountability, has mandated a major assessment initiative. Yet, concern exists regarding NCLB’s narrow approach to accountability. Instead, a broader approach that incorporates a more

comprehensive approach to system improvement is required in both the United States and Canada (Volante, 2007).

Broader accountability frameworks more characteristic of public administration provide a useful conceptual lens through which to consider accountability issues within publicly funded education. For example, the logic model approach (Allen 1996) outlines a useful framework which suggests that current educational accountability models would benefit from a more holistic approach. The potential application of the logic model utilized by the Treasury Board of Canada (2005) to the topic of educational accountability will be considered here as one possible approach. The benefits resulting from the use of the logic model to assess accountability frameworks in publicly funded K-12 education will be the primary purpose of this paper. The use of the logic model, combined with the framework provided by the *Government Performance Results Act of 1993* (United States Government, 1993, Sect. 2(a)), will suggest that current educational accountability frameworks focus unduly on efficiency, or output, measures with little attention provided to more long-term effectiveness outcomes.

## EDUCATIONAL ACCOUNTABILITY: THE CURRENT SITUATION IN NORTH AMERICA

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While most would agree that the current state of public education in Canada does not face the same troubling challenges found in the United States, it also seems clear that a closer working relationship between public education and public administration would produce benefits. The topic of accountability, and the need for a more results-based approach in public education, illustrates these potential benefits. In recent years, this issue has dominated discussions regarding public education renewal in Canada (Saskatchewan Learning 2007; Volante 2007), as well as in the United States (US). Yet, the current accountability debates within public education remain overly narrow and would benefit from the broader policy perspective afforded by public administration, such as New Public Management. Accountability frameworks, such as the logic model utilized in this paper, provide an opportunity to move this important discussion from the current focus on short-term efficiency measures, such as standardized assessment results, to a focus on long-term results and effectiveness.

Concerns regarding the current state of US public education clearly exist. Alan Greenspan (2007), recently retired chairman of the United States Federal Reserve Board, discusses troubling increases in income inequality, commenting that, “A very likely significant part of the explanation for recent developments appears to be the dysfunction of elementary and secondary education in the United States” (399). Greenspan goes on to say:

The impact that fixing our school system would have on our future levels of economic activity may not be easy to measure, but unless we do so and begin to reverse a quarter century of increases in income inequality, the cultural ties that bind our society could become undone. Disaffection, breakdowns in authority, even large-scale violence could ensue, jeopardizing the civility on which growing economies depend. (468)

It seems clear that the concerns regarding the need for a stronger focus on results-based management raised by NPM apply equally to American public education. Raffel (2007), commenting from an American perspective, states:

What public function accounts for one-quarter of state and local government spending in the United States, representing one-third of total government employment in the nation,

and is consistently rated by citizens as their highest priority? ...you might have answered defense or public safety. The answer, however, is public education. (135)

Raffel's comments apply equally to both the Saskatchewan and Canadian situation.

The level of commitment to primary and secondary education in Saskatchewan is significant. The Saskatchewan Public Accounts (2006, 14) reveal that, in the 2006/07 fiscal year, Saskatchewan government expenditures for primary and secondary education totaled \$978 million, or 11.7 per cent of the total provincial budget. The local contribution to education, raised through property tax, provided an additional \$579 million according to Statistics Canada's Financial Management System (FMS), for a total expenditure of \$1.559 billion. Only health-related expenditures were greater. This budget prioritization reflects the importance of PreK-12 education to the public agenda. At the national level, Statistics Canada's FMS reports that educational expenditures, including primary, secondary, and post-secondary levels, comprise 22.7 per cent of total Canadian provincial, territorial, and local government expenditures in 2007 and 23.3 per cent in Saskatchewan.

It seems apparent that public education, from a policy and accountability perspective, is an important priority. Yet, within the field of public administration, issues affecting PreK-12 education receive scant attention. Raffel (2007) suggests that, "A public administration that includes public education would describe and understand the administration of government policy with greater validity, improve public administration and policy development, better prepare graduates to address current problems, and improve public education" (135).

The problems resulting from using an overly narrow approach to accountability within American public education are becoming increasingly clear. Levesque (2004), while addressing accountability issues within American public education, sets the stage for a more detailed discussion of the current approach:

Accountability efforts may be no more prominent in the public discourse than in the field of education.... A major initiative of the current administration in Washington has been the passage of the No Child Left Behind Act [which] requires that states test students in each of grades 3 through 8 and links improvement on these tests to continued federal funding...the trend has been toward greater accountability including more severe or "high stakes" consequences for schools and students... (1-2)

Radin (2006), when discussing the *No Child Left Behind Act* (NCLB), indicates that the "legislation was constructed on top of the existing federal program for elementary and secondary education" (63). Radin (2006) further suggests that:

The effort was described as a way to impose national accountability standards on a decentralized educational system that had high levels of discretion at both the state and local levels of government. The standards would be contained in standardized tests that would be given to students across the nation. (63)

The narrow accountability frameworks that have resulted from the "high stakes" testing culture fostered by the NCLB often means a failure to consider the broader context in which the student and the school system resides. An example of this narrow approach is provided by Wong and Nicotera (2007). While potentially appropriate as a school-based approach, its failure to consider the broader social implications implied by an effective accountability framework are evident. Wong and Nicotera's model intends to:

1. Change expectations for educational leaders and determine who is accountable to whom in the education system.
2. Develop and implement academic and performance standards.
3. Design assessment tools that accurately measure school quality and inform school-improvement decisions.
4. Construct a system to evaluate how effectively schools have met the academic and performance standards and put into action a set of pressure and support mechanisms for low-performing schools. (2007, 29)

While few would question the need for more explicit accountability mechanisms, the NCLB approach as exemplified by Wong and Nicotera (2007) has clear disadvantages. Research by Levesque (2004) and Darling-Hammond (2004) focuses on accountability systems utilized by states and school districts. Both document a variety of dysfunctional outcomes resulting from the “high stakes” NCLB model encouraged by contemporary American accountability frameworks. These range from increased student dropout rates to outright cheating by school staff and system administrators desperate to ensure acceptable test results. Other issues include the disproportionate impact on racial and ethnic minorities, the removal of low achievers – and, on occasion, the entire school – from the test population, increased grade retention, the narrowing of curriculum, and the loss of instructional time as teachers prepare students for tests.

Increasingly, the NCLB accountability approach is being subjected to closer scrutiny. James Popham (2005), a well-known American educational assessment authority, states that:

My chief worry, however, is that during the years between now and then, in where unenlightened implementations of NCLB are present, thousands of children will be educationally marred...because teachers will have been pressured to accomplish ...improvement goals that – in truth – are instructionally unaccomplishable. (152)

The Canadian context, while avoiding many of the problems characteristic of American education, also prioritizes large-scale assessment programs. Volante (2007), in a paper reviewing the Ontario situation, suggests a heavy emphasis upon student assessment as the primary determinate of educational accountability:

Currently, every province and territory, with the exception of Prince Edward Island, administers some form of large-scale assessment. The approach of individual provinces...varies according to the grades tested, sample size, test format, frequency of administration, and, most importantly, stakes attached to student performance. (2)

Volante (2007) further comments that, “The ultimate objective is to move notions of accountability from the realm of simple number crunching to a comprehensive view focused on authentic system improvement. The latter has been sorely lacking in the current mind-set that dominates accountability and assessment-led reform” (2).

While it is hoped that the Canadian efforts at performance management avoid some of the deficiencies faced by the American NCLB model, both demonstrate an overly simplistic approach to the improvement of student learning outcomes. A recent study conducted by Nechyba, McEwan, and Older-Aguiler (2007) for the New Zealand government illustrates the narrowness of current thinking

regarding accountability. This study – which involved an intensive literature review – investigated the impact of factors such as heredity, family, community, and school-related issues on student learning outcomes. It demonstrated the importance of factors other than school-related variables upon learning outcomes. Nechyba et al. (2007) also reviewed the most recent evidence on school inputs, commenting that:

A large literature attempting to link inputs such as class size and teacher attributes to student outcomes has been unable to consistently document large effects, but much of the literature is plagued by methodological problems that are likely to bias results....What remains from these statistical studies is a great deal of uncertainty and a sense that school inputs do not contribute much to student outcomes. (47)

This reference is not included to demonstrate definitive results, since other studies have demonstrated that school inputs, when properly directed (Grissmer, Flanagan, Kawata, and Williamson 2000), can produce positive student learning. Rather, the reference is included to illustrate the lack of clarity in the research surrounding student learning outcomes. It also seems apparent that when discussing the issue of improving learning outcomes, it is necessary to consider a broader range of issues, including the community and the family. Accountability models that focus on only school input factors and standardized assessment results appear unduly restrictive.

In effect, the current approach taken by much existing American and Canadian educational policy is overly narrow in its focus. Initiatives such as the NCLB fail to consider a broader range of public policy options that appear relevant to the challenge of improving student learning outcomes. In fact, critics (Baker 2007; Levesque 2004; Popham 2005) suggest that the current “high stakes” model characteristic of the NCLB may actually be harming students. A more comprehensive approach is required if success is to occur. Teachers, schools, and school systems are expected to produce learning outcomes when they, in fact, have a limited ability to influence these outcomes. Even authors who have argued for more robust assessment models also recognize the need for a broader, more inclusive approach. For example, John Allan (2002), when discussing the need for improved assessment within the Saskatchewan context, comments that:

...we do not mean comparisons that disregard everything other than the test results themselves. Differences in socio-economic circumstances do indeed matter; it is important, therefore, to combine the compilation and analysis of data for these various factors with the assessment outcomes, to determine the statistical significance of each factor and its contribution to observed differences in outcomes. (24-25)

Accountability frameworks drawn from public administration, especially in the application of logic models and performance measurement, provide a stronger conceptual basis for an approach that incorporates a more comprehensive perspective, as advocated by Volante (2007). Current educational accountability models place an undue emphasis on teacher and school-related inputs, often failing to recognize the tremendous potential contribution of a broader policy focus. As a variety of writers (Baker 2007; Darling-Hammond 2004; Levesque 2004; Popham 2005) suggest, the current NCLB model places enormous pressure on teachers, schools, and school systems to produce improved student test results, even though research (Bressoux and Bianco 2004; Grissmer et al. 2000; Nechyba et al. 2007) suggests that their ability to affect these improved learning results may be questionable.

This thinking leads logically to broader notions of accountability. While public education seems

focused upon a relatively narrow, assessment-based approach to accountability, public administration writers present a different picture. As Kearns (1996) indicates earlier, rather than a narrow definition, a broader, more collaborative approach that involves key stakeholders in strategic planning for accountability outcomes is required. This suggests an accountability perspective that is more attuned to realities facing public education and that, potentially, is better positioned to address concerns related to American accountability initiatives (Baker 2007; Darling-Hammond 2004; Levesque 2004; Popham 2005).

## MODELS OF ACCOUNTABILITY AND THE ROLE OF PERFORMANCE MEASUREMENT

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The impact of New Public Management (NPM) on public sector management and the need for improved accountability frameworks has been discussed earlier. Thomas (in Peters and Savoie 1998) indicates that “under the auspices of NPM ideas, the public service of the future...will be expected to demonstrate results based on published performance measures and customer satisfaction standards” (349). Lodge and Kalitowski (2007) reinforce this statement when they discuss growing pressures upon the public sector and the demand for accountability: “Perhaps the biggest trend, however, concerns the advent of what some call ‘results-based government’, and the rapid rise of performance budgeting and performance management as a tool for enabling effective accountability” (8).

It should be noted that NPM, and its expression of the need for increased accountability, exists within a broader context. This is true of both the public and private sector (Neely 1999). Within the public sector, one example is the passage of the *Government Performance Results Act of 1993* (United States Government, 1993, Sect. 2(a)) which established as its purpose to:

- (1) improve the confidence of the American people in the capability of the Federal Government, by systematically holding Federal agencies accountable for achieving program results;
- (2) initiate program performance reform with a series of pilot projects in setting program goals, measuring program performance against those goals, and reporting publicly on their progress;
- (3) improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction;
- (4) help federal managers improve service delivery, by requiring that they plan for meeting program objectives and providing them with information about program results and service quality;
- (5) improve congressional decision making by providing more objective information on achieving statutory objectives, and on the relative effectiveness and efficiency of Federal programs and spending; and
- (6) improve internal management of the Federal Government.

Aside from identifying the role of accountability in improving public confidence in their government, the Act established the primary mechanism of accountability through the application of performance

measurement and performance management models linked with agency strategic planning and public reporting of results. This placed performance measurement at the centre of the accountability agenda and confirmed its role in continuing program development and program evaluation within United States government operations. The critical activity of performance measurement was to support the functions of accountability (especially through public reporting), program review and evaluation, and program management and strategic planning.

The *Government Performance Results Act* identifies a standard model of accountability in government which focuses on generating improved public confidence and improved program effectiveness through monitoring and public reporting on program performance measurement and research on program effectiveness, again supported through measurement of outcomes. Accountability to the public for program effectiveness is achieved through program monitoring or performance measurement and the public reporting of that performance. Program improvement is achieved through research on methods and program design to raise program effectiveness.

While the Act was a major step in the application of performance management techniques in American government, it was part of an evolution of public sector management techniques that had been ongoing for many years in the United States and elsewhere. For example, Thomas (2004), while discussing performance measurement, emphasized its important role in supporting the management and decision-making process.

A review of the literature by Andy Neely of the University of Cambridge identifies the roots of performance measurement in private sector management models as far back as 1910 (1999, 205). While the review notes the work continuing and reaching new levels in the 1950s, Neely points out that “between 1994 and 1996, some 3,615 articles on performance measurement were published” (207). Most of the focus of this work was on private sector production and the evolution of new management models which focused on more strategic measures of production outcomes to avoid the “shortsightedness” that can occur in business success measures such as production targets, annual profits, and profit margins.

Applications of performance management models in public sector activities were also being developed in parallel to these private sector management models. Much of this work grew out of the logic model approach first credited to Joseph S. Wholey’s 1979 publication which approached performance measurement from the perspective of program evaluation and measurement of efficiency and effectiveness. Wholey (1983) further developed the logic model for specific application to public program management in *Evaluation and Effective Public Management*. The logic model provides an excellent heuristic lens to help frame the discussion regarding public sector accountability, including its application to public education.

## ELEMENTS OF THE LOGIC MODEL OF PERFORMANCE MEASUREMENT

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John R. Allen (1996) described the use of performance measurement in support of accountability to governing bodies as well as for resources allocation or budgeting processes, communication with the public, strategic planning, and program evaluation. Allen (1996, 11) described three main types of “results” to be ascertained in performance measurement: work process outputs, client oriented results, and strategic outcomes. The first of these focuses on the direct outputs of the activity under review;

the second on the benefits to the client involved; and, the third on the “social, economic or cultural conditions that the program seeks to influence” (11).

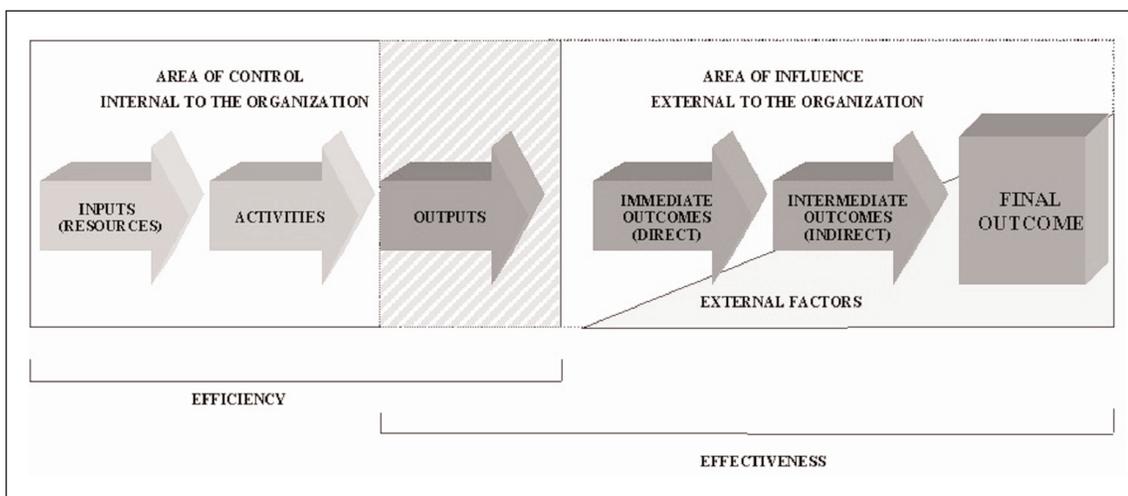
This clearly distinguishes between measurement of outputs and outcomes of program effects, and establishes the importance of identifying strategic outcomes in measuring the impact of programs for accountability and other planning and management objectives in program evaluation.

The logic model is also thoroughly discussed in material produced by the University of Wisconsin Extension Division on Program Development and Evaluation, which distinguishes among performance measurement of inputs, outputs, and outcomes (2005, 1). Inputs are described as “resources, contributions, (and) investments that go into the program” (1) and identified by examples such as staff time, money, equipment, and other indicators of production inputs. Outputs are described as “activities, services, events or products that reach people” (1) and include measurements of activity levels and services provided. Outcomes are described as “results or changes for individuals, groups, communities, organizations...or systems” (1) and are categorized as short-term outcomes, such as changes in attitudes, awareness, knowledge, and skills; medium-term outcomes, which include changes in behaviour, policies and social action; and long-term outcomes, such as changes in social, economic, and environmental conditions.

The University of Wisconsin (2005, 1) model also identifies the need to include two other factors in the analysis of programs: assumptions and external factors. The first of these include assumptions about how the program will work and the context to which it will apply. The second, external factors, indicates the environment in which the program will apply and, more importantly, the other factors external to the program that will affect or influence the outcomes the program is intended to achieve. This clearly indicates that programs do not have to be uniquely determining of outcomes, merely that they be significant and reliable contributors to those outcomes. While long-term societal outcomes may be affected by any number of external factors, even to a greater extent than the program under review, that does not imply that the program should be exempt from establishing and targeting long-term or societal outcomes, or from creating performance indicators for such targeted outcomes. In fact, all that is required is an acknowledgement of the external factors and the extent to which they can be expected to affect those outcomes, either in concert with or in contradiction to the program efforts undertaken.

A similar model of performance measurement has been established for application by the Treasury Board of Canada Secretariat (2005, 2) in their “Results Based Management and Accountability Framework” which is intended to use performance measurement as a tool in support of program design, assigning roles and responsibilities, improving program performance, demonstrating accountability, and providing information for decision-makers and the general public. One of the three core components of this model is the identification of “expected results” based on the application of a logic model, illustrating how the policy or program is expected to “lead to the required economic, social and or environmental change” (8). Figure 1 provides a visual representation of the model.

Figure 1: Treasury Board of Canada Logic Model



Source: Treasury Board of Canada, 2005, p. 1.

The Treasury Board of Canada Secretariat elaborates on this model in its “Results-Based Management Lexicon” publication (2004, 2). The secretariat identifies the use of the logic model to include two components of the area of control internal to organizations (inputs or resources and activities) acting through outputs to the area of influence external to the organization. This area of external influence includes immediate or direct outcomes, intermediate or indirect outcomes, and final outcomes. The Treasury Board model also identifies the need to delineate the role of external factors affecting outcomes which are noted to be “external consequence[s] attributed, *in part* [emphasis added], to an organization, policy, program or initiative” (2). Further, the lexicon notes that outcomes are “not within the control of a single organization, policy, program or initiative, instead they are within the area of the organization’s influence” (2).

Intermediate outcomes are identified as medium term in nature, including changes in behaviour among target populations, while the final outcomes are noted to be the *raison d’etre* of the policy or program and long term in nature, including a change in state of the target population (2).

These models clearly establish that ultimate outcomes of programs need to be focused on true social, economic, or environmental impacts in areas beyond the direct control of the agency and in spheres that are most likely to be influenced by other external factors, as well as the direct outputs of the program under review or consideration. An outcome does not need to be the sole determinant in order for it to be the ultimate objective of the program; and accountability for outcomes, through performance management, should not be taken to imply accountability beyond that portion of the outcome that is affected by the program in question.

Two other important considerations in the Treasury Board (2005, 1) logic model, and which are common to others, are the distinctions between efficiency (the relationship between inputs and outputs) and effectiveness (the relationships between inputs and outcomes, and between outputs and outcomes). The need to identify and measure outcomes of initiatives is underscored as necessary in order to identify and/or improve program effectiveness since without measured outcomes one cannot assess program effectiveness.

Logic models discussed by McDavid and Hawthorn (2006, 44-46) also distinguish between program outputs and outcomes (initial, intermediate, or long-term) and highlight the importance of drawing the causal relationship between inputs and activities, and ultimate or long-term outcomes in establishing program effectiveness, beyond the efficiency perspective offered by examining inputs and outputs alone. This serves to strengthen the application of the Treasury Board Secretariat model, described above, as representative of complete or holistic logic models.

There is also substantial research regarding the required characteristics of performance measures. Hurst (1980) suggested that performance indicators need to demonstrate nine distinct characteristics, including that they be: controllable – they must be affected by the organization; congruent – they must have utility for the whole organization; measurable; unequivocal – not subject to misinterpretation; reproducible in the sense of consistency; accurate in what they measure; objective – not based on judgment; understandable – especially by the subject of measurement; and “choosable” – the subject has choice in what is being measured. Joni L. Leithe (1997, 10) identified good performance measures as appropriate and valid, complete and comprehensive, controllable, affordable or readily available, timely, accurate and reliable, publicly accessible, and comparable among jurisdictions.

Similarly, Allen and Paradis (2007, 4) indicate that performance indicators need to be valid, accurate, clear, timely, readily available at low cost, and not encouraging of inappropriate or undesirable behaviour.

## REVISITING ACCOUNTABILITY IN PUBLIC EDUCATION

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Earlier, a discussion regarding the current status of accountability models in publicly funded education suggested that the approach taken was overly narrow in perspective. This discussion further suggested that holding teachers, schools, and school systems responsible for outcomes over which they had limited control was producing negative outcomes. The need for a broader approach to accountability than currently provided by approaches such as the NCLB was identified. It was further suggested that accountability frameworks drawn from public administration, in particular the logic model, provided a useful heuristic framework. These models provide a valuable conceptual lens through which to revisit the issue of accountability in public education.

A review of literature related to educational accountability and learning outcomes illustrates these key issues. Research results reinforce the argument that schools are being held accountable for outcomes over which they have limited control. In addition, the use of the term “outcome” appears inappropriate to describe results when viewed in the context of public sector accountability frameworks, such as the logic model.

Standardized test assessment results may be described more properly as “output factors”, rather than learning “outcomes”. They represent qualitative dimensions on the direct outputs of educational activities, the third element of logic models, but do not adequately indicate long-term or social outcomes from education. The implication of this statement is significant; it reinforces the argument that the issues related to educational outcomes are complex and require a broader public policy perspective than that provided solely by standardized testing results.

There is an abundance of research examining the relationship between various inputs and what is now referred to as “outcomes” in the education field. As far back as 1981, Eric Hanushek examined the

relationships that have been probed in the literature between various inputs and indicators of school performance. His overall conclusion made reference to efficiency issues, noting that “[t]here is little reason to believe that an additional dollar put into a school will improve student achievement” (1981, 37). However, this expression alone highlights the focus of the research examined by Hanushek, revealing that his own data collection focused on measures of achievement, such as performance on standardized tests (i.e. the Student Achievement Test), and test scores in science knowledge, civics, and social studies. The other studies referenced included 130 examinations of performance related to inputs where performance was indicated by various measures of student “outcomes” as indicated by “performance on standardized tests”, as well as others such as “measures of attitudes and data on school attendance patterns and school dropouts” (23).

While it is interesting that Hanushek’s 1981 review of the studies available noted that the vast majority failed to find statistically significant relationships between input measures and student performance – when comparing inputs such as teacher-student ratio (87 out of 109 studies found no significant correlation), teacher education level (91 out of 101 studies found no significant correlation), or quality of facilities (59 out of 71 found no significant correlation) – it is more interesting from a public policy perspective that all of these studies focused on definitions of performance that do not complete the logic models discussed above. Student performance, whether measured by standardized test or by dropout rates or school attendance rates, is not a measure of strategic outcomes as described in the Treasury Board of Canada Secretariat (2005) Results-Based Management model. At best, these measures may indicate direct outcomes (impact on target population) or indirect outcomes (impact on behaviour of target populations) but do not indicate final outcomes in the sense of social, economic, or environmental impacts of the education process. In fact, one could readily describe measures of student performance, school attendance, and dropout rates as measures of “outputs”, indicating the extent to which the systems succeed or fail in producing graduates of a particular standard quality at various levels of schooling.

Stuart Purkey and Marshall Smith (1983) undertook a similar review of the literature available on “school effectiveness”. This review, which examined over 90 publications in the field of education, also concluded that “easily measured differences among schools (class size variation from 20 to 30 pupils, existing differences in teacher pre-service training, teacher experience and salaries, number of books in the library, etc.) have little consistent relationship to student achievement” (428). In the parlance employed by Purkey and Smith, effectiveness is consistently used to link various measures of school inputs with measures of student performance, especially on standardized skills tests. The study derived from the literature reviewed a set of eight “organization-structure variables” and four “process variables” that determine the “effectiveness” of schools.

Again, while it is interesting to note that these determinants of “effectiveness” are by and large measures of the type or organization of inputs, not input levels, it is more telling from a public policy perspective that the term “effectiveness” is consistently employed to describe a relationship between inputs and outputs, such as measures of graduate ability, in the system. In the current logic models, this relationship would be described as measures of “efficiency” since “effectiveness” is employed to reference the relationships between inputs and final outcomes or, more commonly, between outputs and final outcomes.

Rowan, Bossert, and Dwyer (1983) examined 45 publications in education literature in order to find common factors leading to “effective schools” and found “a number of interesting and plausible effects on student achievement” (30). As with the earlier studies, the work reported by Rowan et al. (1983)

on the “effectiveness” of schools drew on research linking the roles of various inputs with measures of “student achievement” (30). In the more modern parlance of logic models, relationships between inputs as independent variables and outputs as dependent variables, such as student skill on graduation, are referenced as “efficiency” ratios, not measures of “effectiveness”.

Mark Fetler (1986, 35) examined the introduction of performance management systems in California in the mid-1980s and identified statewide targets that had been established for 27 “performance indicators”, including nine measurements of individual enrollment in specific courses, four measurements of reading proficiency, four measures of mathematics proficiency, four measurements of achievement on SATs, five measures of achievement on standardized tests for English, mathematics, and history, the dropout rate, and the pass rate. This indicates that the California program was aimed at improving a number of measures of “outputs”, especially in terms of the number and quality (as measured by tested skills) of graduates; it did not go so far as to propose that there are measurable social outcomes from education.

In the field of education research, a number of studies continued throughout the 1990s with each one drawing on data available to find linkages between various inputs and measures of student performance. Hanushek and Taylor (1990) examined student performance across schools and states. Cotton (1996) examined the relationship between school size and student performance. Thomas, Sammons, Mortimer, and Smees (1997) examined the academic achievement of different groups of students under different conditions. Gibson and Asthana (1998) even went so far as to attack previous research for its deliberate avoidance of linkages between socio-economic factors and school “performance” while it continued to rely on student performance as indicators of “outcomes”. A longitudinal study of school practices conducted by Stevenson and Schiller (1999) references previous work and their own analysis, which focused entirely on how different policies had affected a set of measures of school services provided. However, the indicators selected by Stevenson and Schiller were mainly input measures, such as years required for graduation, with some output indicators for test performance among students.

Grissmer et al. (2000), in a major study of the National Assessment of Educational Progress (NAEP) test results, conducted from 1990 to 1996 across 44 American states, concluded that providing additional resources to states with lower socio-economic status (SES) populations resulted in significant student achievement test gains (99). While the results provide useful policy direction, once again the focus is on an output measure.

Researchers in other fields also limited their focus to output indicators such as student performance. Hanushek continued his analysis in two papers that examined the economics of schools, especially the relationship between school spending and student performance (Hanushek 1997) and the relationships between a variety of input measures and student achievement (Hanushek 1996). Metzger (2003) continued the research of the economists in an econometric examination of the relationship between school size and student performance on standardized tests in Grade 3 and Grade 5. Recent works in education policy have continued the tradition, such as Goldstein (2001) who examined the use of student performance data in evaluating school and teacher performance, drawing the link between input and output measures in the form of quality measures of students.

Rowe and Lievesley (2002) discussed “outcomes-based” education in their paper on educational indicators presented at the Asia-Pacific Educational Research Association regional conference in 2002. In this paper, they noted that good indicators need to have a number of characteristics, including

validity, reliability, relevance, potential to be disaggregated, timeliness, coherence across sources, clarity and transparency, accessibility and affordability, comparability, consistency, and efficiency in the use of resources.

These characteristics are remarkably similar to those identified by Hurst (1980), Leithe (1997), and Allen and Paradis (2007) as discussed above. However, all of the indicators suggested by Rowe and Lievesley (2002) are identified as either inputs or outputs, including enrolment rates, teacher qualifications, expenditures, teacher/pupil ratios, literacy rates, and achievement on standardized test scores (4-5). There are no indicators of outcomes, especially in terms of strategic or long-term outcomes that reflect social, economic, or environmental impacts from education, as would be suggested in a proper application of logic models to performance measurement in education.

Two recent studies on the impact of school size conducted by Newman et al. (2006) and Stevenson (2006) also considered mathematical relationships between a standardized input measure (school size) and several “outcome variables”. The studies actually defined the dependent variables entirely as measures of student performance on standardized tests and/or student dropout or attendance rates. Again, the absence of any long-term social indicators of performance evaluation is noted.

In Canada, two recent studies have been released by the C.D. Howe Institute that examine the relationship between various input indicators and educational results. Johnson (2007) examined a number of measures of student performance and developed a methodology for controlling for socio-economic differences in students’ backgrounds, while measuring their performance on standardized tests. Johnson’s study did find substantial variance in performance after controlling for socio-economic variance among the schools examined, but left this variance unexplained. More to the point, the Johnson study also focused on student performance as a measure of educational outcomes, without making any attempt to find long-term or strategic outcomes from education.

In C.D. Howe’s second recent study, Guillemette (2007) looked for differences in performance between private and public school systems but, again, focused exclusively on measures of student achievement and educational attendance as dependent variables with no reference to long-term, social, economic, or environmental outcomes from education.

These studies all serve to illustrate that “outcomes-based” education research and the application of performance indicators for education policy analysis have almost exclusively focused on measures of inputs (such as levels of spending, teacher qualifications, enrollments, and class time or teacher/pupil ratios) and their relationship with “outputs” of activities (such as measures of student achievement or attendance, or school retention rates). While these exercises are useful in logic models as measures of “efficiencies” by providing an indication of the rate at which inputs are employed to produce measurable outputs, they do not provide useful indicators of “effectiveness” in school programming.

In logic models, effectiveness measures are provided by examining the relationship between inputs and outcomes and/or the relationship between outputs and outcomes. It appears that the education field has applied the terms “effectiveness” and “outcomes-based” to imply a much narrower field of vision than is implied by modern logic models employed in performance management in the public sector. This confusion in vernacular reinforces the earlier concern that the educational sector, either through a lack of research on effects of education or through an incomplete implementation of strategic planning models, has adopted a much narrower perspective with respect to accountability than has been employed elsewhere in public policy in the application of logic models. In effect, this confuses outputs with outcomes and unduly limits their focus to the former.

## EDUCATIONAL OUTCOMES: A REDEFINITION

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Public administration models of accountability adopt a broader perspective relative to the more narrow approach characteristic of public education. For example, the logic model proposes a framework that includes input, output, and outcome measures; within this context, it appears that standardized assessment results are, at best, short-term outcomes, and, arguably, are more appropriately described as output quality measures. This is an important distinction because current educational contexts tend to encourage a more short-term focus on “outcomes” that, as has already been described, have produced dysfunctional consequences as schools scramble to produce improved test scores, regardless of the means.

The accountability perspective provided by public administration models encourages a broader view of these issues. Within this context, achievement test results are an important output, or short-term outcome, measure. However, these results must be considered within the broader frame of medium term and long-term outcome measures in regard to their implications and, especially, their contribution to improving broader social conditions that are legitimately characterized as outcome measures.

## AN IDENTIFICATION OF SOCIAL OUTCOMES

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A survey of relevant literature suggests that most of the research behind “outcomes-based” education and education policy has been focused on testing for linkages between education inputs and outputs or, possibly, short-term or direct outcomes. However, there has also been other social science research that has tested the relationship between educational effort or outputs and long-term strategic or social outcomes. This literature serves to illustrate the value of a broader perspective with respect to accountability.

A United States Congress Joint Economic Committee report (2000, 9-11) cited studies linking higher levels of educational achievement and higher levels of educational involvement with lower crime rates, higher voting activity levels, lower reliance on welfare, and lower rates of illegitimate births. These studies did not address the issue of the direction of causality nor did they explore linkages between types of education or level of educational input and social outcomes; instead, they focused entirely on identifying measures of effectiveness between educational outputs and long-term or strategic educational outcomes.

A report from the Organization for Economic and Co-operative Development (OECD) prepared by Karine Tremblay (2002) provided a review of research on social benefits of education. The report indicated that from 1971 to 1998, there was a positive correlation between economic performance and human capital among OECD countries and concluded that “the estimated long-term effect on GDP of one additional year of education in the population aged 15-64 is around 6 per cent on average” (22). Further, the report found that the returns to society as a whole exceeded the returns to individuals involved in the education process.

A review of the economic literature conducted by Sianesi and van Reenen (2002) identified a number of econometric studies that investigated the relationships between schooling effort and various social indicators. Sianesi and Van Reenen examined 13 studies of the relationship between school inputs and outputs, such as enrolment rates, average years of schooling, and measures of economic growth. In all

these studies, there was a positive mathematical relationship between schooling effort and overall economic growth performance (21-25). Sianesi and Van Reenen (28) also identified one study that examined the relationship between types of education and economic performance but only considered professional education types such as engineering and law.

Sianesi and Van Reenen are careful to note the dearth of research linking stages and types of education, or the quality of education, with particular economic outcomes (2002, 38-39). They discuss the need for more research in this area, as well as the uncertainty that continues to exist in the direction of causality in relationships between education effort and economic performance. This highlights the lack of research on the relationship between different types of education at different levels and social indicators, such as economic growth or productivity changes, and the need to clarify the theoretical basis of any such relationships.

The OECD also produced a follow-up report, conducted by Frederic Gonand (2007), examining the impact of efficiencies in school operations on overall economic performance. Gonand found that efficiencies in operations in primary and lower-secondary schools had an overall positive impact on economic growth, whether or not those efficiencies were converted into reduced inputs or higher outputs. This study illustrates a connection between school inputs and overall social impacts, as measured in terms of economic growth, and begins to address the issue of measuring effectiveness in school operations, at least in one dimension.

Elizabeth Appiah and Walter McMahon (2002) examined the impact of primary and lower-secondary education on a number of social variables in 35 African countries between 1985 and 1995. The authors studied various outcomes including the rates of overall economic growth and also attempted to identify the magnitude of externalities associated with education levels in different countries. Their findings suggest a positive relationship between education levels and increased life expectancy, lower infant mortality rates, lower fertility rates, lower poverty rates and reduced inequality of income, greater democratization and political stability, higher environmental sustainability, and lower crime rates. In many cases, however, these outcomes variables were affected only after substantial time lags, often as much as 40 years.

Thomas Dee (2003) conducted an empirical analysis to see if he could identify a relationship between educational achievement and various measures of “civic involvement” in the United States, as indicated by measures such as voting in presidential elections, reading newspapers, and belonging to community groups. In this study, the author attempted to control for other socio-economic factors that may also affect the level of civic involvement such as family socio-economic status. While Dee discusses the possibility that civic engagement and educational attainment may be mathematically related or mathematically related to some other factor without a clear direction of causality, the strength of the relationship is taken to imply direct causality. Dee concludes that “educational attainment, both at the post-secondary and secondary levels, has large and independent effects on most measures of civic engagement and attitudes” (2003, 24). These results would suggest that there are social benefits to be derived from education in the form of increased civic engagement, thus reducing the costs of maintaining and operating political processes within society and improving the effectiveness of the political process.

The National Centre for Education Statistics (2004) (NCES) of the United States Department of Education produced a review of some of the social outcomes of education in their *Digest of Education Statistics, 2004*. The review noted that persons with higher levels of education were more likely to be

labour force participants and less likely to be unemployed, and would have fewer difficulties in entering the labour market and higher income levels (441-457). It should be noted that these relationships were tested for grade attainment starting at the high school level, so the results are mainly focused on post-secondary education levels. In addition, the NCES work identifies mathematical relationships without testing for direction of causality and does not distinguish the relationship between educational inputs and outcomes; rather, the work is focused on relationships between educational outputs and educational outcomes, which, in turn, are limited to private returns to education without identifying broader social implications. Nevertheless, the study does indicate a linkage between educational outputs and private outcomes for education and, potentially, broader social policy outcomes, which are also linked to individual labour force engagement and success.

A review of research by Craig Riddell (2006) of the University of British Columbia examined the many aspects of social impacts of education besides the benefits said to accrue to individuals. For example, research referenced by Riddell credits education with increasing the rate of innovation, knowledge creation and, therefore, economic growth. Riddell cites studies on this topic which have identified positive social returns to education beyond the private returns to those educated (which varies between 2 and 4 per cent), suggesting there is some small but positive impact of education on overall economic growth (17). In his review, Riddell (2006) also refers to studies that identify “knowledge spillovers” or transfers of knowledge from educated people to their co-workers and concludes that the research in the area would suggest that “there are social returns of 1 to 2 percent associated with [such] spillovers” (18).

Riddell also examined the literature on non-market effects of education, including effects on individuals’ health, spouses’ incomes, children’s health and social outcomes, consumer and labour market choice efficiency, charitable and volunteer activity, social cohesion and voting behaviour, reduced reliance on social programs, and reduced criminal activity. While results in each of these areas are often conflicting, Riddell does conclude in each case that there is empirical evidence of a positive relationship between education levels and positive social outcomes (2006, 18-24).

It must be noted, as Riddell does, that any discussion of returns to education, private or public, is based on an assumption of acceptance of human capital theory, which suggests that the role of education is to impart productive capacity to educated people that was not present prior to the process of education. It is only in the context of this approach to education that one can conceive of the process generating benefits. But, as Riddell notes, alternatives to the human capital model, such as the “signaling” or “screening” model, would also explain the presence of relationships between education and certain social outcomes, even if that relationship is not one of causality (2006, 3-6). There are important policy implications that distinguish a human capital model from a screening or signaling model, and the resolution of this inconsistency is important to any successful policy development in this field. For this reason, this matter will be discussed further as an important limitation to this paper.

In conclusion, it seems apparent that there is an important linkage between educational inputs and broader, long-term social outcomes. This literature reinforces the need for a more holistic approach to educational accountability than is currently the case. It also reinforces the reality that when discussing educational outcomes within the context of accountability models, a simplistic approach based on standardized achievement test results is insufficient. In addition to failing to address the impact of genetic and environmental factors, such as heredity, family socio-economic status, or the community, the previous discussion clearly describes the importance of a more long-term perspective in regard to accountability in public education (Nechyba et al. 2007).

## LIMITATIONS

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The work discussed above may be best characterized as consistent with human capital theory, which indicates that investments in education and training produce valuable benefits by building the human capital of individuals and society. The research discussed above indicates that there may be some evidence of relationships between educational output levels and a number of broad social outcomes. Many of these relationships are negatively affected by significant time lags as indicated by the work of Appiah and McMahon (2002). In addition, there is very little work identifying, with certainty, the direction of causality of these relationships.

While human capital theory would suggest a relationship of causality between educational effort and outputs and various measurable social outcomes, this relationship is less clear in the context of a screening or signaling hypothesis. This suggests that education may not contribute to productive capacity as much as identify pre-existing capacity, following on the original discussions of K. Arrow (1973). Work done in Spain and France by Barceinas-Paredes et al. (2001) suggests that there is some evidence providing weak but positive support for the screening hypothesis, at least in developed countries. This uncertainty of causality, while having significant implications for all education policy, is a limiting factor in the development of logic models in education.

It is also notable that limitations to the effectiveness of accountability models based on performance measurement have been identified by some, including Beryl Radin (2006) who discussed the conflict between measurable outcomes in performance management models and traditional social justice objectives, such as equity, which may not lend themselves so readily to measurement.

Paul Thomas (2007) has also identified major practical difficulties in the application of performance-based accountability models, which have yet to be resolved. These difficulties suggest that caution should be used in developing reasonable expectations of such models, although at least one of the barriers to successful application of performance measurement identified by Thomas, that of difficulty in measuring outcomes, may be overcome by paying greater attention to the extensive work already done in identifying and quantifying the connections between educational actions and the social outcomes discussed above. In this case, the limitations may not be in the difficulty of measuring outcomes as much as in a failure to extend accountability models in education as far as is already supported by indicators of social outcomes.

## CONCLUSIONS

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Accountability models currently applied in public education place a premium on standardized assessment results and do not reflect a meaningful accountability framework as employed elsewhere in public policy. Instead, a broader perspective that is more characteristic of public administration models offers a useful conceptual lens to assess educational accountability frameworks.

The logic model provides an excellent conceptual lens. It suggests that standardized assessment results are more appropriately considered as output measures, rather than educational outcomes. A wide range of research indicates that, although financial resources that are properly directed can positively impact student learning (Grissmer et al. 2000), the link between school-based inputs and student outputs is much more complex than current educational accountability models recognize. In effect,

teachers and schools are being held accountable for student learning results that they have a relatively limited ability to affect. A broader definition of outcomes is required.

There is substantial evidence from the social sciences and other fields that there is a significant relationship between educational output levels and a variety of social outcomes. These outcomes include economic growth and labour force success, as well as population health, lower crime rates, increased social cohesion, and democratization. Meaningful accountability models need to situate educational accountability within this broader context. While it appears likely that there will be substantial lags between educational effort and positive social outcomes, the existence of these lags and the need to plan programming strategically to achieve desirable social outcomes is the very nature of public policy, in education or in any other field of social policy.

There is further evidence that the education process is only a partial determinant in achieving the long-term strategic outcomes discussed above. However, this is not a reason to abandon the use of performance indicators or the application of logic models. As noted, the use of logic models does not require that programs under review be the sole determinant of any social outcome; it is only important that the review process identify other external factors which are already at work and the extent to which the program under review can reasonably be expected to affect the outcomes under consideration. Logic models accept that there are external factors which also affect social outcomes. These models require only that those factors, the extent to which they affect outcomes, and, by elimination, the extent to which programs under consideration may also be reasonably expected to affect outcomes all be clearly delineated in program considerations. Effective program evaluation and management requires a clear understanding of the roles played by all factors affecting social outcomes in order for program managers to be fairly and reasonably accountable.

The fact that there are important external factors affecting social outcomes that operate in tandem with, or against, educational practices is not a reason to ignore the social and economic “outcomes” of education. In fact, to do so is to avoid establishing reasonable expectations for the system and to stand in the way of continued improvement in research and methodology related to educational accountability as the effort to achieve long-term social goals. A properly designed accountability framework, based on the logic model, could be instrumental in increasing the quality of education through research and the design of effective education methods and strategies. More effective accountability frameworks will support improved educational delivery and will improve learning experiences for children. Ultimately, increasing learning opportunities and creating a better future for our children must be our goal.

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**Jim Marshall** is the Chief Economist at the Saskatchewan Institute of Public Policy. In his 30 years of government service, Jim Marshall has held many prestigious positions, such as Assistant Deputy Minister, Economic and Resource Policy Saskatchewan Industry and Resources; Senior Project Manager, Crown Investments Corporation of Saskatchewan; Executive Director, Economic and Fiscal Policy Branch, Department of Finance; and, Senior Economist, Taxation and Economic Policy Branch, Department of Finance.

Jim Marshall taught in the Department of Economics at Brandon University, Manitoba, and conducted research for the Library of Parliament in Ottawa before starting with the Government of Saskatchewan. He is currently a sessional lecturer in the Johnson-Shoyama Graduate School of Public Policy.

**Larry Steeves** is currently an Assistant Professor in the Faculty of Education, University of Regina, teaching in areas such as educational finance and organizational theory. He completed a Ph.D. in Educational Administration from the University of Saskatchewan in 1991, specializing in organizational theory and behavior, critical theory, and teacher supervision and development. His current areas of research interest include accountability frameworks, educational investment and student learning, school size and learning outcomes, and protection for minority faith education adherents.

His previous work experience includes over 30 years of public service. He has held numerous positions in the field of education, including Coordinator of Guidance Services in Rocky Mountain House, Alberta; School Principal in Mayfair, Saskatchewan; and Director of Education in the Prairie View and Estevan Public School Divisions. More recent experience with the Saskatchewan provincial government includes service as Associate Deputy Minister in Government Relations and Aboriginal Affairs, Deputy Minister of Northern Affairs, and Associate Deputy Minister in Learning.



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