



District Research in a Nut Shell

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Introduction

This paper was written with the intention to share what is currently known about District Researchers in Ontario, what they do, how they are trained and how they support their organizations. There are stark inequities in Ontario with respect to each district having the capacity to support a district researcher or a research department as part of central office staff. The privilege seems to be reserved for the larger boards, however, as will be seen here, we argue that every board should have at least one dedicated researcher allocated to it, or in smaller communities commit to a shared role. The rationale is simple, district researchers add value in many ways to the strategic, operational, organizational and financial capital of a school board.

As educational institutions, district school boards are interested in research that represents the intersection of institutional policy and practice on academic outcomes and in the creation and management of monitoring processes and systems to support decision making. Taking this as our operational definition of the research conducted in context of the organizational milieu, the intention of this paper is to review what a district researcher does, and can do, by illustrating real-world examples of impact. In addition, this paper will also address the areas in which district school boards can utilize research staff by highlighting several structures or models of research departments according to board size, and, last, provide a taxonomy of research staff skills, capacities and expertise. In that way, we hope to contribute to the discussion around educational and mathematics leadership in Ontario.

The literature supports the notion that educational leadership subsumes educational research, meaning that leaders in education need to rely upon and conduct research. We also believe that all educators, regardless of the educational institution or level at which they teach, must develop research skills to conduct, for example, action research or be part of a collaborative inquiry (CI). After writing about different forms of teacher research, some of which could be downloaded from the MKN website, here we seek to acknowledge the role of a district school board researcher.

Defining Research

The American Educational Research Association (AERA) defines [Educational Research](#) as, “the scientific field of study that examines education and learning processes and the human attributes, interactions, organizations, and institutions that shape educational outcomes. Scholarship in the field seeks to describe, understand, and explain how learning takes place throughout a person’s life and how formal and informal contexts of education affect all forms of learning. Education research embraces the full spectrum of rigorous methods appropriate to the questions being asked and also drives the development of new tools and methods.”

Institutional Research is defined as “the sum total of all activities directed at empirically describing the full spectrum of functions (educational, administrative, and support) at a college or university. Institutional research activities examine those functions in their broadest definitions and, in the context of both internal and external environments, embrace data collection and analytical strategies in support of decision making at the institution” (Middaugh, 1990).

(1) Why Hire District Researchers? Two Rationales

Given the push for accountability, transparency and evidence-informed decision-making in Ontario Education, there is a strong business case for districts to include research staff or departments as part of their organizational structures. In addition to the business case there is also a strong ethical and social justice case for the investment in research staff.

The Business Case

According to the Association for Educational Researchers of Ontario, since 2012, the Ministry of Education has been shifting toward a culture of evidence-based policy and practice using research, evaluation and data¹. Similarly, the school boards' research departments were formed as fiscally responsible investments that expand and reinforce the capacity of their senior administration to engage in evidence-informed decision making. This capacity is built cumulatively through their research staff professional training, experience, associations and collaborations.

The services and products a district research department provide evidence for decision-making that is credible and defensible. In turn, high quality, evidence-based decision-making by senior leaders increases public confidence, and avoids organizational and fiscal waste and redundancy. From a business case perspective, research departments directly support the financial health of the district and are worth the investment.

Large non-profit organizations, such as the Center for Addiction and Mental Health, think-tanks, Rand Corporation, and governmental agencies employ some form of institutional research capacity.

The Social Justice and Ethical Case

Social science and educational research training is grounded in social justice and ethics. For social scientists, the creation and advocacy of social policy must be based on science (Eagly, 2016), but is also dependent on the value system the society promotes. Similar to other social scientists, educators are concerned with existing power structures (Wang, 2007). Thus, ethical educational research needs to be intersectional in nature to expose singular thinking around sameness in race, gender and other axes of power within political and academic disciplines (Cho, Crenshaw, & McCall, 2013).

For the most part, educational research explores realistic contexts and dynamics within layers of society (e.g., human attributes, interactions, organizations, and institutions that shape educational outcomes). Whenever collecting data from humans, district researchers are incredibly conscious of this intersectionality, the use of labels, and the way in which language is operationalized for measurement purposes. In addition to ethical data collection, academic research departments are also grounded in critical inquiry (Peach, 2017). Combined, the values of critical inquiry, ethics and political situatedness create a research atmosphere that supports social justice inquiry and promotes change for the better.

¹ <https://knaer.files.wordpress.com/2012/08/aero-discussion-paper-26novfinal.pdf>

District research can increase the capacity of educator practice and provide timely and credible evidence toward policy and decision-making (Heinrich & Good, 2018).

Whether the rationale for a district researcher or research department is made on the business case or the social justice ethical case, the supervision and support of a district research department requires an understanding of the educational research context. In conducting research, the call for innovation to challenge dogmas and create knowledge that will ultimately serve the general public is deeply embedded in the training and philosophy of the research professional. Research can challenge authority in an ethical bid toward social justice by exposing oppressive structures. This can be a difficult concept to grasp in contrast to the business case philosophy whereby the institution itself relies on the research department to mitigate risk and control communication and knowledge mobilization. Without a balance, on the extreme end, there is censorship, groupthink and flawed decision-making. This value-laden foundation requires that in order to be credible, trustworthy and defensible, the department will best operate at arms-length from the internal organizational politics. Researchers, in turn, may struggle to communicate effectively to advocate for policy change partly due to the fact that research findings are more complex and less affirming than what was originally conceptualized, requested or desired (Eagly, 2016). As this occurs, researchers could be shunted to the sidelines, with their findings exploited and inaccurately portrayed or ideologically polarized (Eagly, 2016).

The tension district researchers contend with is how to manage their duties in an organization that has its own political goals and mandate, while trying to stay true to their professional identity. The inclination of researchers is to question and challenge concepts, methods, processes, and limits in their quest to produce research that is trustworthy and generalizable. Without an in-depth understanding of the professional researcher's identity a conflict can result in what appears to be attempts to undermine messaging, direction or practice. On the contrary, this internal questioning and probing strengthens inquiry and prepares members of the organization to communicate or implement findings with a clearer understanding of implementation, scale and impact of decisions. Ultimately, both the leaders and the district researchers need to commit to understanding the limitations or scope of the findings and being prepared to respond to anticipated criticisms.

(2) Impact and Return on Investment

Research departments require funding allocation which has budgetary implications producing an expected *return on investment*, which could be financial, such as saving by reducing redundancy, time, mitigating risks, advocating for product choice based on privacy impact assessments, or long-term costs of implementation. *Returns on social impacts*, could be in the form of increases in human capital, staff efficacy, learning capacity, and improved relationships with stakeholders through trust and communication. These impacts can be seen and measured at school (micro), district (meso) and Ontario/system levels (macro) levels. Research departments are experts in measurement, and therefore could be included in the co-development of benchmarking and key performance indicators for areas such as school improvement, district improvement, organizational efficiency (HR and Policy effectiveness), strategy performance, program evaluation and community engagement metrics.

Researchers support any areas of inquiry relevant to a K-12 school board such as equity, literacy, school improvement, leadership, professional learning assessment, and specialized education to name a few. In the next section, we provide examples of the kinds of products and services district researchers produce for the district. In Table 1, we provide a specific example of how district research has supported mathematics education in Ontario.

Examples of Services provided by District Research

- Providing professional development in data literacy
- Conducting literature reviews

- Evaluating programs
- Working collaboratively with community partners concerning data requests or third-party program evaluations
- Conducting Privacy Impact Assessments
- Using implementation science framework for program implementation
- Monitoring change management initiatives for a continuous improvement
- Developing Research-Practice Partnerships with universities or academic institutions
- Managing District Research Ethics Review Boards
- Developing research instruments (e.g., rigorous and credible surveys based on theory)
- Collecting and analyzing methodologically sound qualitative and quantitative data
- Presenting at practitioner and academic conferences
- Supporting communications departments with knowledge mobilization best practices of research and findings.

Topical examples

- Supporting staff/student census data design/collection/deployment/communication
- Designing and providing analysis of professional learning efficacy
- Supporting educators with action research and CI
- Strategic Planning.

Table 1. Examples of how district researchers impacted mathematics education in Ontario

Micro – School Level	Meso – District Level	Macro – System Level
<p>CI in mathematics led by research staff to work collaboratively with educators and admin to address mathematics education issues. Research staff provided training about how to conduct CI, helped shape the inquiry question, helped staff design their own formative and summative assessment of their work and see the impact of their efforts on student outcomes. The result of research staff supporting CI at the school level resulted in increased collective efficacy of staff in the area of mathematics pedagogy, assessment, and empowered staff to take ownership over their own professional learning needs. With increased group efficacy, staff turnover is less likely, better relationships are formed between staff, students and administration, which leads to a positive work culture. Measurable increases in student engagement and academic performance are likely.</p>	<p>Data Literacy, monitoring district efficacy through Strategic Planning support. Research staff can support board leadership in learning about logic modeling, creating targeted action plans, and data strategies to support program or project implementations. With respect to implementing new mathematics curriculum, research staff can support the development of clear baselines, longitudinal data collection and tie educator learning to student outcomes by providing senior staff with reportable metrics of progress. Research support results in streamlined and aligned district improvement processes, planning, implementation and evaluation. This support, in turn, increases leadership capacity, trust in district activities, supports clearer communication, and identification of priorities. Strategic planning is not limited to five-year intervals, but is a continuous improvement process.</p>	<p>As a system, district researchers network to develop tools and resources to support system efficacy with large data sets and analysis. For example, the Data User Group has created R scripts for common analyses and PowerBI dashboard templates, for district consumption and assessment. There are a myriad of opportunities for sharing and collaborative development given the large data sets common across boards such as EQAO, EDI, and Statistics Canada socio demographics. Networked sharing and training between districts provide common approaches to analytics, data visualization, and updated technical skills in workshops. This collaboration saves significant time for individual districts who are analyzing large, cumbersome datasets independently. The time saved allows the data to be distributed to decision-makers quickly and allows for targeted areas of improvement. Common analysis frameworks also introduces an alignment of interpretation and reporting.</p>

Reporting Structure Location within a District

Although there are exceptions, research departments in Ontario School Boards tend to be located in one of the following three places in their organizational hierarchy: (a) program or instructional services department, (b) the director's office or (c) the IT department. The location of the research department often alludes to the services the organization expects of the department and has implications on how that department interacts with other parts of the organization:

- Program/Instructional Services Department: Support is prioritized for academic services and involves the cyclical analysis of data such as EQAO, EDI. The research focus is supporting different instructional consultation teams with the measurement of professional learning in smaller groups or initiatives. Project support is less centralized and may be asymmetrical in terms of what project gets support and the time in which it takes to support a particular project. Data collection tools are often developed and administered as part of Ministry initiatives as well as board and school initiatives such as collaborative inquiries. Given this focus, staff in these research departments often prepare project summary reports and present results to administrators and school staff. Being located in the Program/Instructional Services department often means having the most direct access to school administrators and staff. It can also result in support that is siloed from system-wide initiatives or strategies specific to certain portfolios. Knowledge mobilization of data and learning can be fragmented in this context and the risk is high for lower district alignment.
- IT Department: In some cases, data analyst staff work as part of the IT department. If the department or research capacity is seen as highly quantitative, the impact will narrow. The advantage is that the analyst can have a focus on system data collection and analysis with the most direct access to influence the definitions and processes related to the board data systems and warehouses. This placement is a close connection with the data structures, processes and flow of data for the district. The disadvantage is possible lower concept of educational context in complex areas such as equity, or culture. The data-centric model is seen as an end-product whereby the analyst is typically asked to produce reports at the end of a project or cycle which limits perspective and possibility of scope. Data collection begins with the concept development and program design, and the power of the data can therefore be limited if the analyst is only relied on to provide summary data.
- Director's Office: Support in this case is prioritized for system level initiatives, evaluations and program alignment. Data collection, monitoring and analytic tools are often developed to directly support Superintendents and their portfolios. Being located in the Director's Office can result in less contact and availability with school administrators and school staff, but greater system alignment.

To date, in Ontario, predominantly medium to large sized school boards have dedicated research staff. Several boards have allocated an educational consultant or principal to oversee a data or research portfolio. In smaller school boards that lack the funds to hire research staff, developing the capacity of educational consultants or principals through effective networking and sharing of papers, findings and other resources, can be an effective way to build system capacity for all.

The Ministry of Education's Managing Information for Student Achievement (MISA) initiative had the potential to bridge the gap between the 'research have' and 'have-not' boards. Although the MISA Professional Network Centres (now defunded) initially had a focus on the development of technical capacities in school boards (e.g., student information systems, student registration data collection, business intelligence tools), it could have pivoted to a focus on research capacity and drawn on/extended the availability of existing research capacity across the province. The development of these data systems through MISA have made school boards data-rich and, in some boards, has made access to data easier for their staff. This, however, revealed a new problem; easier access to data does not ensure the proper use of data. Using the data inappropriately to make decisions can have costly consequences of wasted time and resources. When the underlying methodologies of data collection are unknown or hidden (e.g., assumptions inherent to the collection tool, who participated in the collection, who were excluded from the collection, which records are included/excluded in analysis) or when the inquiry question is not unpacked and the assumptions made clear, the resulting decision may be biased and ineffective (at best) or harmful and marginalizing of the staff and students it was intended to help (at worst). Knowledge and skills to work through the interaction of privacy, ethics and methodologies are seldom found in IT departments who are most often called on in the absence of researchers. Researchers are obliged to follow the Tri-Council Conduct for Research Involving Humans policies, that provide the guideline for researchers and their institutions to apply the ethical principles to ensure that research conducted are of the highest ethical and scientific standards.

Profile of a Research Professional

We thought it might be helpful to break down what specializations research staff may have. The term researcher is general, and there are a wide variety of skills that researchers can, and do, possess. Additionally, the titles given to researchers in boards provide little insight to their roles. For example, the title Research Associate in one board may suggest a permanent role with project management responsibilities, whereas Research Associate in another board may refer to a temporary contract position. Similarly, researchers with supervisory responsibilities may be given the title of Chief, Officer or Manager. The following descriptions of researcher types is offered to provide insight into the kinds of services researchers can be expected to provide given typical training. The overarching capacities have been separated into three general themes—quantitative, qualitative, and mixed/multimethod.

DATA ANALYST/QUANTITATIVE RESEARCHER: Most of the work these researchers are tasked with involve conducting surveys and analyzing system data. Data analysts devise surveys and feedback forms based on available research or based on environmental scans (search of open-source government websites, grey papers, and media sources) and create surveys or questionnaires for students depending on developmental level or age. Younger students require unique developmental survey methods such as systematic observation and coding of observed behaviour. Middle school children require very clear and simple language and short surveys, whereas older adolescents can be surveyed more sophisticatedly. Survey development can include

The 2018 Tri-Council policy states:

A fundamental premise of this Policy is that research can benefit human society. In order to maximize the benefits of research, researchers must have academic freedom. Academic freedom includes freedom of inquiry; the right to disseminate the results of that inquiry; freedom to challenge conventional thought; freedom to express one's opinion about the institution, its administration or the system in which one works; and freedom from institutional censorship. With academic freedom comes responsibility, including the responsibility to ensure that research involving humans meets high scientific and ethical standards that respect and protect the participants. Thus, researchers' commitment to the advancement of knowledge also implies duties of honest and thoughtful inquiry, rigorous analysis, commitment to the dissemination of research results, and adherence to the use of professional standards. There is a corresponding responsibility on the part of institutions to defend researchers in their efforts to uphold academic freedom and high ethical, scientific and professional standards. (p. 5)

parents/guardians, teachers, other board staff, senior leaders or other community stakeholders, and requires questionnaire development that is based on psychometrics, theory/concept knowledge and statistical knowledge. Survey analysis involves painstaking work to clean the data to get rid of blank spaces, errors, ensure consistency, remove troll entries, and develop a group characteristics or summative ways to manage the data appropriate to the planned analyses. Analysis may employ a range of tools and skills including general software (Excel, Access), specialized software (SPSS, STATA, SAS, QGIS, ArcGIS), or programming languages (R, Python) and business intelligence tools (Power BI, Tableau).

Most analysis involves grouping, categorizing, and describing summary descriptive statistics. Designing a paper or online survey begins with the fundamental properties of how to set up a database for subsequent analysis. Survey design is done in tandem with data and analysis planning. Many senior leaders may not appreciate the complexity or length of time it takes to prepare data for analysis, or the ways in which the analysis may need to be justified if ever publicly questioned. There are multiple ways in which data can be presented, and the researcher must find the most appropriate way to display, defend and explain the data according to theory. The researcher then prepares the findings for public consumption and reporting within weeks as opposed to months. Some researchers that are specifically quantitatively trained have coding skills for cleaning and presenting data. Presentation means the data must be in a readable format free from too much jargon. Many researchers have become adept at graphical design and have learned to create infographics that are stunning and interactive. In order to mobilize the knowledge learned from the research activities, researchers must be adept at creating a narrative for senior leaders so that the findings are both engaging and parsimonious for multiple audiences.

WHO IS BEST SUITED FOR THIS WORK? Much of quantitative analyst work can be found at the Master's level in sociology, psychology and education psychology. At the PhD level, the researcher will have advanced expertise in educational theory and methods, psychological theory and methods for example.

DATA SCIENTIST: This type of quantitative work is similar to the work the analysts do, however, the skills for this role include computer programming, artificial intelligence or business intelligence. School boards have very large data sets that require careful and ethical cleaning and data wrangling. These individuals have specializations in extracting data from multiple databases, designing APIs (application programming interfaces) so databases can talk to each other and correct parameters for data can be extracted. Large data extraction must be managed and combined with other sources of data. This specialization requires an in-depth understanding of mathematics, statistics and computer software.

WHO IS BEST SUITED FOR THIS WORK? There are several data science programs in Ontario that have terminal Master's degrees. A Master's degree in business analytics or data science would be ideal, as a doctoral level data scientist would be a costly hire. The scientific premise behind the statistics is what makes this position not part of IT, as the database design and production of results is based on statistical theory not common to database administrator training. This difference has to do with the structure of data itself that is specifically used for empirical testing. Setting up data for research purposes is complex and requires different training than what is taught in computer engineering for example. As stated above, a PhD is likely not necessary for this role, but if the school board is extraordinarily large, it may be worth considering for the investment as they may have teaching and academic partnerships that would be valuable for innovation. It is possible to find a talented individual who can fulfill these quantitatively focused roles with an undergrad degree, however, without the rigour of having to defend a thesis, the long-term developmental capital of the Master's versus the undergraduate degree is a better decision as they can likely write and incorporate research theory and concepts to support their work more professionally.

QUALITATIVE RESEARCHER: These researchers are concerned with lived experience, voice, context, words, stories, ethnography, narratives, culture, arts-based methods or alternative ways of knowing, indigenous research methods, power-structures, intersectionality (i.e., race, gender, sexuality) and social justice. These researchers are typically trained to employ methods that include focus groups, case studies, interviews, and policy analysis. Some

boards have begun to deploy researchers to conduct community engagement work which is not formal data-collection per se and requires a different approach procedure and carries different goals and expectations. A qualitative researcher is ideal for community engagement work as ethics, equity, rapport-building and being able to facilitate conversations, are the key skills for the qualitative researcher.

The skills required for qualitative methods are not the same as the training and skills required of quantitative researchers or analysts. If a school board is fortunate enough to have funding for two researchers, usually one has strengths in quantitative and the other in qualitative methods. It is even rarer to have a lone researcher who is highly skilled in both areas. As school boards now look towards alternative ways of knowing, culturally responsive research methods such as Critical Race Theory, Black and Indigenous research methods for example, are becoming more and more sought after. Those who are engaged in this type of work, however, are not the individuals who will likely have quantitative skills required to analyze large EQAO datasets for example. Thus the challenge for districts is that they must prioritize through a needs assessment about what kind of research they need most (if only hiring one, or balancing out for more research staff).

WHO IS BEST SUITED FOR THIS WORK? Qualitative expertise is not usually found at the Master's level. At the PhD level, there would be a high level of confidence in the rigour and credibility in the work which can be highly politically sensitive. PhD in Education, Counselling Psychology, some Educational Psychology (if focus was qualitative), Sociology, Disability Studies, Anthropology, Black or Indigenous Studies are typically rigorously trained in these methods.

MIXED/MULTIMETHOD RESEARCHERS: We have placed Program Evaluation expertise within the context of multiple methodology as it typically includes expertise at the Master's level in quantitative and qualitative analysis. Program evaluation professionals can be credentialed through associations like Canada Evaluation Society. According to AERO in 2012, program evaluation is defined as the systematic compilation of evidence about the activities, inputs/outputs, and outcomes of program to make conclusions about the efficacy of a particular program. Evaluation theory is based on how to gather credible information to answer practical questions characterized by social, political and financial constraints (Donaldson, Christie, & Mark, 2015). Much of program evaluation expertise is in applied health research, or health methods. Seeking credentials as part of ongoing professional development can be supported through the district. Beyond program evaluation, there are researchers who are trained in both qualitative and quantitative methods, and most have learned on the job working in applied research capacities. For example, one of the authors of this paper with Master's in quantitative psychology conducted a qualitative methods educational study for her PhD.

Advice for Smaller School Boards Structure

Of the 72 school boards in Ontario, approximately half have the capacity for a researcher or a research department. In these cases, there are superintendents, academic learning consultants, principals or educators who take on the role of a data analyst or a research lead on top of their duties and portfolios. We offer two possible scenarios to support smaller boards with building their research and data literacy capacity. Now that MISA is no longer a viable network connecting districts, partnerships between smaller and larger boards could be created to share tools, literature reviews, surveys and research requests from universities. Many times, universities will reach out to several school boards to conduct research. If a particular district has an established in-house research ethics board, and the same project is requesting participation from another smaller board, there can be some shared understanding and decisions with respect to these research applications. Many researchers in the MISA network talked about a more centralized and reciprocal REB for school boards so that multiple districts are not reviewing the same proposal or conducting several privacy impact assessments which can be time consuming and redundant. Small boards have the benefit of working across large geographical spaces and have more rural and Indigenous populations. A reciprocal relationship between boards is a win-win for all stakeholders.

Second, we advocate for research-practice partnerships (RPPs) with universities. Cobourn and Penuel (2016) state the benefits for strong RPPs provide mutual benefits for both universities and districts. Districts benefit from professional continuous improvement whereby practitioners who are working with academics can learn about the efficacy of interventions with rigorously collected data, or support school-wide problems of practice. Universities on the other hand, learn about the boundaries and realities of applied research in classrooms or organizational contexts. The School Board – University Research Exchange (SURE) was a collaborative initiative designed to bridge research and practice in the London region of the Ontario Ministry of Education. It presented a collaboration between 16 regional school boards and five Faculties of Education (i.e., Brock, Nipissing, Western, Wilfrid Laurier and Windsor).

Conclusion

Data and research literacy in the field of education differs from mathematical literacy in that, there are philosophies of science drawn from several disciplines such as psychology, sociology, anthropology, and business, to name a few. Data and research used in districts for assessments, student tests, and to inform decisions are only useful if applied appropriately (Cobourn & Turner, 2011). There are complexities in data collection such as explicit and implicit belief-systems, privacy, psychometric design to questionnaire development, test item construction as well as the methods used to quantify and qualify what counts as good evidence. The scientific, individual, organizational and political factors inherent to data and research literacy are discriminant from mathematical literacy. Researchers, therefore, are best suited to complement and work collaboratively with teaching experts in curriculum design and delivery.

Cobourn and Turner (2011) suggest that the collaborative work of researchers is to facilitate the cooperative approach to data literacy in districts. Research staff can help identify tools, opportunities for initiatives to collect data, and relate data to accountability measures. Researchers can also assist district staff with the governance of data and research within the organizational context. Researchers are well prepared to co-creating guidelines about use and knowledge that include discussions about equity, power relations, norms, interpretations and implications for leadership.

In summary, district researchers are consumers and creators of information and knowledge. They are able to critically evaluate what is credible or defensible material and disseminate important findings to ensure optimal evidence-based decision-making can occur. The work supports ethical and transparent business practices. District educational researchers, in comparison with other academic field specialists, are uniquely situated to share their findings with non-professional audiences and “contribute to a more educated citizenry, but also increase the influence of educational research in political deliberation, democratic dialogue, and concrete social change” (Hill, 2012, p. 153). Furthermore, district researchers are public intellectuals that deserve to have their profession understood as distinct and rigorous.

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