Data Driven Decision-Making Tools for School Leaders: Developing Tools that Enculturate Distributive Leadership and Shared Decision-Making

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Abstract

Many school leaders who sought to enculturate distributive leadership and shared decision-making within their schools/school districts may not have adequate data tools that would encourage teachers and educational leaders to actively participate during times of decision-making. School organizations may struggle in this area and could benefit from the decision-making practices of other learning organizations (Adler-Greene, 2019; Azeska et al., 2017; Darrow, 2016; Flowers & Carpenter, 2009). One such learning organization that has experience in the data decision-making cycle is the U.S. Army (Greer et al., 2018; Hernandez et al., 2017; Parham; 2015; U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019). This field study explored and compared the cultural use of decision-making tools of a U.S. school district located in the Southeastern region of the United States of America to the cultural use of decision-making tools of a U.S. Army Military unit located in the Southeastern region of the United States of America. The results suggests that U.S. Army decision-making tools may be more sophisticated in solving complex problems than current education decision-making tools used by school principals and enculturates practices of distributive leadership and shared decision-making (Greer et al., 2018; Hernandez et al., 2017; Parham, 2015; U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015).

Keywords: Decision-Making Tools, Distributive Leadership, Shared Decision-Making, Data-Driven Decision-Making, Decision-Making Process.

The Republican and Democratic accountability-driven educational policies of No Child Left Behind (NCLB), Race To The Top RTTT, and the Every Student Succeeds Act (ESSA) are influencing how school data is utilized for decision-making and may require educators to explore other cultural paradigms to change how educators practice decision-making (Adler-Greene, 2019; Azeska et al., 2017; Darrow, 2016; Marino, 2007). Despite the recent political influences and accountability policies for data-driven decision-making, very little empirical research exists to describe or interpret the decision-making processes and tools of school leaders or to provide school leaders with descriptions and interpretations as to how other learning organizations, such as the U.S. Army, conduct decision-making processes. Data-driven decision-making is the comprehensive process to make decisions based on data derived from sources such as school demographics, student learning, stakeholder perceptions, and school process data (Datnow et al., 2017; McREL, 2003; Park & Datnow, 2009).

This much-needed research may inform school leaders on how they might construct or improve upon current decision-making tools, such as data walls and decision-making models for use in facilitating continuous school improvement (Datnow et al., 2017; McREL, 2003; Parham, 2015; Park & Datnow, 2009; U.S. Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015).

Review of Literature

School Data Room or Data Wall

A school data room or data wall can be a useful tool for displaying and presenting information; moreover, an established data room with a data coordinator to analyze, present, and update the data can stimulate the collaborative use and analysis of school data in the decision-making process (Harris et al., 2020; Goss & Hunter, 2015). DeLisio (2009) used the term *data room* and made physical comparisons of the school data room to a military war room.

The U.S Army war room/data room is referred by its occupants as a Tactical Command Post (Tac-CP) or Tactical Operations Center (TOC) because of its primary focus on fighting land battles (U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015). The significance of the TOC in its historical and present-day function is to serve as a forum for military staff to focus on the analysis of data and sharing of data and to create knowledge that drives collaborative and data-driven decision-making (Hernandez et al., 2017; U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015).

Both organizations have cultures worth exploring improvement in decision-making processes; however, the research literature suggests that educators should explore paradigms different from the current decision-making models available to them. Therefore, the researcher selected the U.S. Army (Marino, 2007).

Comparing the tools used for decision making

The purpose of this ethnographic field study was to explore and compare the cultural practices of data-driven decision-making within two paradigmatically different learning organizations. To

guide the study, the researcher asked *what decision-making tools exist at the two comparative sites?* The researcher studied a K-12 public school system in the Southeastern United States of America and a U.S. Army unit in the Southeastern United States of America (Fetterman, 2019; LeCompte & Schensul, 2010; Miles, Huberman, & Saldana, 2014; Parham, 2015). Observations of the participants' actual cultural practices enabled the researcher to construct thick cultural descriptions and interpretations of how and why these two different culture-sharing groups behave the way they do in their natural settings (LeCompte & Schensul, 2010; Miles, Huberman, & Saldana, 2014; Fetterman, 2019).

A data room/wall is not to be a static display of year-end standardized test scores, discipline reporting statistics, or attendance rates. A data room/wall is to be an ever-changing display of school data that is composed of records of school process data, perception data, and school demographic data. The update periods could range from weekly in the classroom, to monthly in the school, to mid-term and semester at the district level. A primary function of data walls is to increase collaboration between educators by providing a visual representation of student data. The increase in collaboration amongst educators could lead to better decision making regarding instructional practices and student progress monitoring (Adie et al., 2020; Harris et al., 2020; Parham, 2015). Current literature, however, lacks thick descriptions and interpretations of how an organization or culture actually transforms the data on a data wall or in a data room into knowledge for their decision-making processes based on their decision-making tools (Fetterman, 2019; LeCompte & Schensul, 2010; Sallee & Flood; 2012).

Current Decision-Making Tools in Education

Educational leaders may sustain effective data-driven decision-making by adopting or developing decision-making tools that provide visual frames that facilitate distributive leadership and share decision-making powers. The research literature suggested the following three decision-making models developed by Mid-continent Research for Education and Learning (McREL), The Research and Development Corporation (RAND) and Flowers & Carpenter for educational leaders as decision-making frameworks to help drive a decision-making process (DuFour & Reeves, 2016; Flowers & Carpenter, 2009; Lange et al., 2012).

The data-driven decision-making framework developed by McREL (2003) calls for educators to develop strategies for collaboration concerning the use of data and calls for the establishment of a school leadership team and data team to facilitate "a respectful, trusting culture in which data can be collected, analyzed, and used constructively to increase student achievement" (p. 3). It provides a sustainability framework for what an effective school data-driven decision-making process should look like through the lens of five processes.

The RAND study offers a conceptual framework that addresses the need for educators to seek multiple types of data, such as: *input* data, that shows school expenditures or the demographics of the student population; *process* data, displaying data on financial operations or the quality of instruction; *outcome* data, depicting dropout rates or student test scores; and *satisfaction* data from the opinions of teachers, students, parents, or the community (pp. 2-3). Flowers and Carpenter(2009), found that many educators lack the statistical skills to properly identify and analyze data for data-driven decision-making and offered a five-step process to help guide educators in identifying and analyzing school data: 1) Review your school improvement plan to identify goals and your primary focus, 2) Determine how the data will be used, 3) Reduce your total amount of data by identifying only the relevant data to support your school improvement

plan, 4) Objectively examine and discuss the data with teachers, staff, and other stakeholders, and 5) Set goals, evaluate the progress of your decision-making and return to step three for continuous improvement (p. 65).

U.S. Army Military Decision Making Process

The U.S. Army Military Decision Making Process (MDMP) is a proven iterative planning methodology that is driven by a seven step decision-making tool known as the Military Decision Making Model (MDMM) (Hernandez et al., 2017; Parham, 2015; U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015): 1) Receipt of mission. The leader and followers acknowledge and discuss the impending mission given to them by a higher authority or leader, 2) Mission analysis. This step empowers subordinate leaders to systemically analyze the mission given to them, so that they may better understand their purposes and roles in accomplishing the mission, 3) Course of action development. Next the subordinate leaders and staff collaboratively design two or three solutions to the problem; to include how the organization needs to be restructured to accomplish the mission known as *task organization*, 4) Course of action analysis: In this step the courses of action are analyzed by the staff using a list of priorities (rubrics) provided by their leaders and/or higher authorities, 5) Course of action comparison. Collaboratively, subordinate leaders and staff wargame (compare/contrast each course of action), 6) Course of action approval. Throughout this step, the subordinate leaders and staff present to the leader the best course of action to accomplish the mission. The leader is now asked to accept their solution, reject their solution, or offer a different course of action, 7) Orders production, dissemination, and transition. Lastly, the approved course of action is published and disseminated to subordinate units (U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019; U.S. Army Field Manual, Commander and Staff Organization and Operations No. 6-0, 2015).

Although, the research literature presents three distinct decision making models designed to inform the decision-making practices of educational leaders, the models do not adequately provide a structured framework that suggests they are capable of assisting educational leaders in designing solutions for crisis situations or complex problems. However, the U.S. Army Military Decision-Making Process provides an iterative planning methodology with defined steps and participant roles from which educational leaders may consult to design more effective decision-making tools similar to the Military Decision-Making Process (MDMP) and the Military Decision Making Model (MDMM) (Greer et al., 2018; Hernandez et al., 2017; Lange et al., 2012 Parham; 2015; U.S Army Doctrinal Publication, The Operations Process No. 5.0, 2019).

Methods

Ethnographic descriptions and interpretations of the Study Site Participants' cultural practices during decision-making were made to see if what happens during their decision-making process is consistent with what each group espouses as to how they practice decision-making. Data was collected in the forms of participant observation, interviews, material culture, and field notes. The preceding data collection methods were employed by the researcher because these methods enabled the researcher to better code data and to construct thick cultural descriptions and interpretations of how and why these two different culture-sharing groups behave the way they do

in their natural settings (LeCompte & Schensul, 2010; Miles, Huberman, & Saldana, 2014; Fetterman, 2019).

Sampling Strategies and Participant Selection

Following LeCompte and Schensul (2010) the "criterion-based sampling" strategy of "theoretical case selection" guided the researcher to select two distinct cases or communities that are each separately bounded by common cultural traits and cultural characteristics because a field study approach seeks to explore, describe, and interpret the cultural life of a community

The researcher selected three U.S. Army participants that were commissioned officers at the rank of Major/O4 or on the promotion list for the rank of Major/O4. Moreover, commissioned officers at the rank of Major/O4 should have extensive experience in using the Military Decision-Making Process (MDMP). The researcher selected three U.S. K-12 public school principals as study participants because school principals should have extensive experience in making decisions and conducting school meetings. The principals were selected from an elementary school, a high school and from a grades 9-12 college magnet academy in which the attending students could earn up to two years of college credit upon graduation. School principals and U.S. Army Majors should have both the experience in their jobs and longevity in their cultural communities to provide data that are characteristic of the cultures that exist in U.S. public schools and the U.S. Army, respectively.

Data Collection Procedure and Analysis

Upon exiting the field sites, a review all of the data was conducted by hand to facilitate the researcher establishing a general feel of the data while simultaneously reflecting on the methodology, data collection methods, and research questions that framed the study (LeCompte & Schensul, 2010; Fetterman, 2019).

During stage one of a two stage data collection and analysis process, a folder filing system was used to manage the files and hand-code large sections of data using an initial list of codes that were derived from the research literature, the research questions, and the researcher's professional experience. Correspondingly, during stage one of the coding process the researcher managed the data analysis and codebook development by creating files for the transcribed data and codes using Microsoft Word. The researcher audio-recorded and transcribed every interview verbatim with consent from the participants. The transcribed interviews, observation notes, analysis of material culture, field notes, and initial codes were later computer-coded, managed, and analyzed with the assistance of Atlas.ti7. Atlas.ti7 is a type of Computer Assisted Qualitative Data Analysis Soft-Ware (CAQDAS).

During Stage two of the data analysis, the researcher utilized Atlas.ti7 to assist in the process of transforming the Microsoft Word files into Primary Documents, the coding of data segments, the development of analytic memos to construct emergent themes, network views to visualize data patterns, hyper-links to connect data patterns, and the development of a codebook (Friese, 2019; Miles, Huberman, & Saldana, 2014; Fetterman, 2019). The development of the codebook was computer-assisted with Atlas.ti7 CAQDAS. By using Atlas.ti7, the researcher was able to create more of a coding system that prints out a codebook with code names, code definitions, and code comments.

The researcher established authority for this study using the verification strategies of triangulation, thick description, prolonged engagement in the field, member-checking within each cultural-sharing group, researcher reflexivity, discussions for bias, and addressing ethical considerations for anonymity (Friese, 2019; Miles, Huberman, & Saldana, 2014; Fetterman, 2019).

Results

To guide this field study, the researcher asked *what decision-making tools exist at the two comparative sites?* The researcher's efforts in exploring and comparing the existence of decision-making tools yielded evidence that the two culture sharing groups bear a stark contrast in the existence and use of decision-making tools. The participants at the School study site had no organizational decision-making model and only two of the three principals established a data wall or data room. The U.S. Army Study site participants made use of various organizationally developed decision-making tools, to include the Military Decision-Making Model and Process. The patterns of information that emerged from the researcher's computer assisted coding and analysis of the data resulted in finding the following three themes.

Theme 1

Decision-making models do not exist at the School study site to frame an individual or team decision-making process. However, all three participating U.S. Army units utilized the Military Decision-Making Process and Model for decision-making.

The culture-sharing group of educators observed by the researcher at the School study site did not have a decision-making model. Conversely, the culture-sharing group of U.S. Army participants at the Military study site consistently used an organizationally developed decision-making model. The U.S. Army decision-making tool for team decision-making is the Military Decision-Making Model (MDMM), and when army leaders conduct decision-making, it is called the Military Decision-Making Process (MDMP).The participating principals made the following statements in support of this theme.

One principal said: "Well, currently we do not have a decision-making model, we just try to do what is best for the kids." A different participant principal reinforced the previous principal's quote by saying:

> I would say there is not a formal decision-making model. I try very hard to go to our School Improvement Leadership Team. It is something you know that is extremely important to the whole school. But, most of, the majority of the stuff that happens, you just do it on the fly. But if it has to do with the whole school, I try very hard to incorporate the leadership team. There is not a fast and furious way we do it, you know. We don't have one.

During an interview separate from the previous interview, a third principal stated:

> There is no formal model that I use. Um, nothing that we have been trained on that is consistent throughout the school district. Um, so any decision-making model is just basically my preference as to how I choose to make decisions.

The participating U.S. Army leaders made the following statements in support of this theme:

A captain said:

> The biggest model that we use is the Military Decision-Making Process (MDMP). It is done at battalion level or higher level, um, there is also a Decision-Making process that you have to use at the company level called the Troop Leading Procedures (TLP). One model is the Military Decision-Making Process and in order to conduct that you normally have a bigger problem set that you are trying to solve and you need a lot of manpower. If you are trying to solve a problem on your own, we refer to the troop leading procedures, which is really the foundation of all our problem-solving, the troop leading procedures.

A participating British officer at the rank of major on assignment to the U.S. Army, reinforced the comments from the captain by saying:

> Well. There are two models which we teach here for planning and decision-making. The first one is the Troup Leading Procedure, known as the TLP, which we use at the company level and below for groups of 150 people and less, then teach another planning process for battalion level and above so for groups of 150 people plus really and uh that's called the Military Decision Making Process.

A U.S. Army major continued to inform this theme by saying:

> We use the Military Decision-Making Model throughout every branch of the service. Militarily, the Army and the Marine Corps are much better at it in the junior grades because we use it so much, and we teach it to our young captains, uh, so that they are able to take command of companies and then they get assignments as a staff officer at brigade and battalion levels.

Theme 2

Data rooms or Data walls are not present in all the participating schools at the School study site. However, a Tactical Operation Center to facilitate decision-making exists in all three participating U.S. Army units.

Each research study site made use of rooms that served as decision-making tools to post or analyze data for organizational planning and decision-making. At the School study site, this type of decision-making tool was a Data Room/Data Wall; similarly, at the Military study site this type of decision-making tool was the Tactical Operations Center (TOC). However, the similarities between the school Data Room and the U.S. Army TOC end with the structures optimally having four walls. Whereas the school data rooms regularly post summative school data such as the end of year test scores, the U.S. Army research study site TOC had wall postings of formative data that provided detailed information concerning current individual soldier and unit proficiency testing results in first aide training.

Two principals stated that they had a data room or were in the process of developing a data room. The third participating principal had not established a data room. Each principal knew what a data room was, but there were some differences as to how the data room was to function for collaborative data analysis. During an interview, one principal stated that there was not any set protocol or standard operating procedure for his data room. He added, "Currently, it is basically

used to store and post information. There is no set protocol or procedure to post data weekly or for teachers to come in and look at data weekly, but we are moving in that direction."

All three participating Army units established a Tactical Operations Center to conduct the Military Decision-Making Process (MDMP). A member check conducted with a Captain verified the structure and contents of a military Tactical Operations Center (TOC). The captain made it clear that the function of a TOC was more important than its form. He continued to be specific by saying: "The structure and contents of a TOC may differ from unit to unit; however, the function of a TOC is quite similar from unit to unit, especially those of a similar size, with similar purposes or missions." The captain also stated that each TOC should have a Standard Operating Procedure (SOP), which prescribes how a TOC is to function, including the task, the particular purpose of the TOC, and the roles of the staff assigned to work in the TOC. The point here is that whereas school leaders are concerned with the form and structure of the data room, the Army leaders are related with the function of the TOC, the Running Estimates/Protocols, and the responsibilities of the staff that uses it for collaborative data analysis and data-driven decision-making.

Theme 3

The principals at the School study site did not use any organizationally developed decision-making tools such as decision-making protocols or templates to inform their decision-making process. However, the Participants at the Military study site consistently used organizationally developed decision-making tools such as decision-making protocols and Running (Staff) Estimates/Templates to share and verify information/data.

The cultural behaviors of the U.S. educational participants at the School study site during decision-making varied widely among the different schools studied. The various practices were a result of the vague to nonexistent staff relationships at the different schools and the organizational climates created by the school principals. Conversely, the cultural behaviors of the U.S. Army participants at the Military study site during decision-making were common among the participating units being studied and driven by a formal decision-making process. The Military Decision-Making Model and supporting data tools helped to cultivate the observed U.S. Army participant behaviors of being transparent, collegial, collaborative, trustworthy, and adaptive.

During an interview, a principal asked for an explanation of the findings at the Military Study site. Upon hearing of the researcher's conclusions, the principal made the following reply:

> Yeah! Cause, the thing is, um, to have a formal model, well, what I would think of it as a template on how to approach good decision-making usually brings more consistency to the decision-making process. Um, more than likely, without knowing exactly how the military does, it seems as though they get a lot of input what we call "buy-in." Creating "buy-in" with the teachers and it is a process that yeah, I think if people know what the decision-making process is, uh, they will feel more comfortable that the best decisions are being made with the best available information. Uh, you know we try to establish that, but there is not a set of, -- I do not have any set guidelines, so yeah, I think it would be very useful.

The previous principal utilized the term "template" to create a mental model of what he understood the military models to represent. Although the MDMP, TLP, and Running/Staff Estimates are more than just templates, the word template would serve as an excellent

interpretation to help fellow educators comprehend the basic format of the various military decision-making tools found by the researcher at the Military study site.

Table 1, below, summarizes the themes presented and discussed in this section.

Table 1

Resulting Themes

School Study Site	Military Study Site
Data Rooms or Data Walls were not consistently used at the participating school study site.	Tactical Operations Centers (TOC) were consistently used at the participating military study site.
No use of any formal decision-making process like those found in the research literature or organizationally developed decision-making process to frame *DDDM was found at the school study site.	The Military Decision-Making Process and supporting tools to frame *DDDM were used by all participants at the military study site.
No organizational decision-making tools such as Templates, Protocols, or operationalized terms to Drive *DDDM was found at the school study site.	Organizationally developed data tools such as Running Estimates (Templates/Protocols), operationalized terms, Standard Operating Procedures (SOP's) for decision-making, and anchor charts to inform *DDDM was incorporated into every observed Military Decision Making Process and displayed along facility walls.

* Data-Driven Decision Making (DDDM)

Limitations of the Study

This Field Study had the following six limitations:

1. Access to the School study site participants was initially limited to non-contract time by School District Officials. The participants later agreed, however, to meet during their contract time if the researcher would not interfere with routine school operations.
2. Access to the U.S. Army study site participants was limited to Officers at or near promotion to the rank of major/O4 because they would have the minimal level of military knowledge, training, and experience concerning the use of U.S. Army decision-making tools.
3. At least two of the three military study participants had to be at the rank of major or a foreign officer of equivalent rank on assignment to the U.S. Army to assist the researcher's efforts towards the triangulation of data and member-checking to better inform the researcher's interpretations of the findings.
4. Each military participant needed to have at least one year of duty remaining at the Army study site so that they would be available to complete this study.

5. Each school participant needed to be a school principal with at least one year of experience and expecting to remain employed within the study site for at least one year to remain part of the research study.
6. One principal had to be an elementary school principal, one principal had to be a high school principal and the third principal had to be from a middle school or Magnet program to assist the researcher's efforts towards the triangulation of data and member-checking to better inform the researcher's interpretations of the findings.

Recommendations for Practice and Research

The participants from the School study site did not use any type of organizationally developed decision-making models nor any of the decision-making tools discussed in the researcher's review of the literature (Flowers & Carpenter 2009; Marsh, Pane, & Hamilton, 2006; McREL, 2003). According to McREL (2003), schools should avoid making the mistake of collecting data and having no explanatory model to interpret the data in terms of how the data should provide the school with information that positively influences learning. The absence of educational decision-making tools like the U.S. Army Running/Staff Estimates and Military Decision-Making Process makes it difficult for school leaders to cultivate leadership and staff relationships that create the "buy-in" the participating principals said they desired for school improvement planning (Azeska et al., 2017; McREL, 2003). Additionally, the development of better decision-making tools for educational leaders could stimulate vertical and horizontal interdependent staff relationships leading to an increase in collegial conversations, team learning, systems thinking, improved accountability, and shared visions (Azeska et al., 2017; Darrow, 2016; Lange et al., 2012; Park & Datnow, 2009).

The researcher offers the five following recommendations resultant from the findings of this field study. The first recommendation is for school leaders to immediately study and use the extant decision-making models for educators within the current research literature beginning with the models found and discussed by the researcher in this study. The second recommendation is for school leaders to adopt or create an organizational decision-making model that closely reflects the defined participant roles, iterative nature, and step-by-step process situated within in the Military Decision-Making Process. The third recommendation is that educational leaders focus more on defining the roles of school staff for decision-making sessions and less on the physical appearance of data tools, such as overly colorful data walls that obscure information meant to be extracted for the purposes of monitoring student progress and achievement. The fourth recommendation is for school leaders to collaboratively operationalize the meaning of data and data terms used during the conduct of decision-making to promote data literacy and competency within their respective schools and school districts.

The final recommendation is for educational leaders to display the operationalized school data terms and definitions used for organizational decision making in the data room or along the data wall. A well understood decision-making vocabulary that is commonly known and spoken amongst school colleagues could promote the transparency, trust, and "buy-in" that was desired and stated by the principals at the School study site as a need. The simple displaying of decision-making terms along a data wall or within a data room would be similar to how teachers frequently display instructional terms as anchor-charts along classroom walls to support their instruction.

Summary

In this article, the researcher explored and compared how a U.S. Army military unit conducts decision-making and uses decision-making tools to how a U.S. k-12 public school district conducts its decision-making and uses decision-making tools. The researcher sought to gather empirical data that could provide information to educators that contribute to the development of decision-making models and decision-making tools for educational leaders. Additionally, information was asked that could help cultivate a culture of decision-making within the field of education where data analysis is collaborative, leadership is shared, and decision-making is data-driven. This research suggests that the U.S. Army Military Decision-Making Model and Process as decision-making tools are different from any educational decision-making models described in the researcher's review of the literature addressing educational decision-making models. It is the researcher's intent that the empirical data and interpretations provided from this field study contribute to the development of better decision-making tools for school leaders that enculturates the distribution of leadership and informs a shared decision-making process that is data-driven.

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