Data-Driven Decision-Making

How is data used for decision-making in public schools in Dubai?

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February, 2009

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Abstract

The word data means factual information such as measurements or statistics that are used as a basis for reasoning, discussion, or calculation. Therefore, just as the term implies, data-driven decision making is the process of making data informed decisions.

Data is very important in education because statistical data on school programs and student performance provide educators with the only real evidence of the success or failure of educational programs. Data identifies the link between teaching and student performance so that high achievement levels can be obtained (Wade, 2001).

This paper seeks to clarify which multiple types of data are being used in the public schools in the Unites Arab Emirates. This paper primarily focuses on the understanding of educators in using multiple types of data in the public schools in the UAE and how much and how well they gather and use data in schools.

This paper is divided into three sections. Section 1 describes what data-driven decision making is, including its origins, its implementation in education and an overview of existing literature. Section two draws attention to the answers the research questions by evaluating data-driven decision-making in the two chosen schools. The last section is about recommendations for those schools.

This paper addresses four fundamental research questions:

• What types of data are administrators and teachers using?
• How are administrators and teachers using these data?
• What kind of support is available to help with data use?
• What factors influence the use of data for decision making?

Methodology

The purpose of this study is to investigate practices in using data in secondary public schools in Dubai to inform instructional, policy and evaluation decisions. The methods that are used are as follows:

- Case studies of 2 public schools in Dubai (Madares Al Ghad Schools-MAG)[1]
- Survey
- Interviews

The information that is shared in this paper about the first school, which is a public secondary school for girls in Dubai, was mostly gathered through daily observations, small talks with the teachers and the administrators, formal and informal interviews with the teachers and the administrators. A survey about how teachers use data for school and student improvement was also given to twenty one teachers in the school (Appendix 1). Transcripts of the formal interviews can be found in appendix 2. The transcript of the interview with one teacher is also available in appendix 3. Some samples of different types of data that the school stores are also shown in appendices 4, 5, 6, 7 and 8.

In the second school, which is a public secondary school for boys in Dubai, the information was collected through one formal interview with the principal and the principal advisor and several informal interviews with the English Department Team Leader and the coordinator. The interviews could not be recorded in this school. The questions that were asked in the interview are listed in Appendix 2. The administration showed the data that was sent by the Ministry, but it was not

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[1] Madares Al Ghad (MAG) is a reform project in the United Arab Emirates. 50 public schools are chosen, elementary and secondary. In secondary schools principals have advisors and English teachers have teacher mentors and leaders. There is an ongoing training and mentoring.

appropriate to copy any documents. The same survey about how teachers use data
for school and student improvement was also conducted in the school and ten
teachers participated (Appendix 1).

Section 1

   A. Data-Driven Decision-Making

      Data is part of our daily lives. Almost all of our decisions in our daily lives are data-driven in one form or another. For example, when we hear thunder, we take our umbrellas with us because we know that thunder suggests it's going to rain. We don't take time to ask ourselves, 'What does this data mean?' there is no inquiry or analysis involved. We simply react to what we see and hear. This can be called assumption decision making. This kind of decision making is not suitable for education although it might be the form most widely used. In education data needs to be interpreted and analyzed.

      Decision making is about deciding what action to take. In decision making there are a number of steps:

- Define the problem
- Collect relevant data
- Decide if expert input is needed
- Elicit relevant opinions/input
- Produce draft solution
- Assess any consequences of each solution
- Select ideal solution
- Convey decision to the team
- Implement solution
- Measure success

      Data collection is the most important part of the decision-making process. Data-driven decision-making is the process of making choices based on appropriate

analysis of relevant information. Decision-makers in the Ministries use technology
and professional expertise to improve instruction and operations.

Data driven decision making in education refers to teachers, principals, and
administrators systematically collecting and analyzing various types of data;
including input, process, outcome and satisfaction data to guide a range of decisions
to help improve the success of students and schools.

More access to better information enables educational professionals to test
their assumptions, identify needs, and measure outcomes. Data are important sources
of information to guide improvement at all levels of the education system and to hold
individuals and groups accountable. Schools are using data-driven decision making
to provide more individualized instruction to students, track professional
development resources, identify successful instructional strategies, better allocate
scarce resources, and communicate better with parents and the community.

The concept of data-driven decision making in education is not new and can
be traced to the debates about measurement-driven instruction in the 1980s (Popham,
2005); or school system efforts to engage in strategic planning in the 1980s and
1990s (Schmoker, 2004).

In the history of education the decisions were based on the best judgments of
the people in the education of authorities. Educational leaders had both the
responsibility and the right to make decisions about students, schools, and even
education more broadly. They used knowledge of the context and logical analysis
while making the decisions. Data did not play any role in decisions. In the past
several decades, a great deal has changed. Accountability and data took the greatest
role in educational reform. The ministries and the schools have implemented large-

scale assessment systems; established indicators of effectiveness; set targets; created inspection and review programs (Whitty, 1998; Leithwood, Jantzi, Steinbach, 1999).

Data are facts that are usually collected as the result of experience, observation or experiment, using quantitative or qualitative methods. In education the things that are measured are almost always intangible concepts like intelligence, learning or quality. For example, a mathematics achievement test for 10th grade is constructed using a limited number of items that are chosen to represent all of material in the curriculum for that level. If a student does well on this test, it is assumed that the student would do well in all parts of the curriculum if it is covered in the classroom. Teachers start to use the test to decide what to teach and this makes the test invalid. The test no longer serves its purpose and the numbers may appear very objective, but they do not mean what they are purported to mean. Data, then, are nothing more than symbolic representations expressed in numbers or in words. Data acquires value by transforming these symbols into knowledge by shaping the information, or organizing it and thinking about what it might mean. Data-driven decision making is a process that requires not only capturing and organizing ideas, but also turning the information into meaningful actions (Senge, 1990).

The improvement in educational organizations is related to responsiveness to different types of data. There are four types of data:

1.　　Input data

Input data provides descriptive information on items such as school expenditures, enrollment, attendance, the demographics of the student population like nationalities and language proficiency. Demographics are very important because they show us the past trends and also the future trends. One year demographic data can answer questions like:

- How many students are enrolled in the school this year?

- How has enrollment in the school changed?

2.   Process data

Process data includes instructional strategies and classroom practices. It also gives information about the financial operations. To collect school process data, educators must systematically examine their practice and student achievement. One year of school process data can answer the questions:

- What are we doing to teach reading?
- How have we been teaching reading for the past five years?

3.   Outcome data

Outcome data describes an educational system in terms of standardized test results, grade point averages, standard assessments, and other formal assessments. Analyzing one year of student learning data can answer questions like:

- How did student at the school score on a particular standardized test?
- Are there differences in student scores on standardized tests over the years?

4.   Satisfaction data

Satisfaction data helps us understand what teachers, students, parents or the community think about the learning environment. This kind of data can be gathered in a variety of ways, such as questionnaires, interviews, and observations. One year of satisfaction data could answer the questions like:

- What are current parent, student or teacher perceptions of the learning environment?
- How have perceptions of the learning environment changed?

B. Conceptual Framework of Data-Driven Decision Making in Education

District –School- Classroom

Types of data $\Rightarrow$ Information $\Rightarrow$ Actionable

Types of data
- Input
- Process
- Outcome
- Satisfaction

Types of decisions
- Set and assess progress toward goals
- Address individual or group needs
- Evaluate effectiveness of practices
- Assess whether students needs are being met
- Reallocate resources in reaction to outcomes
- Enhance processes to improve outcomes
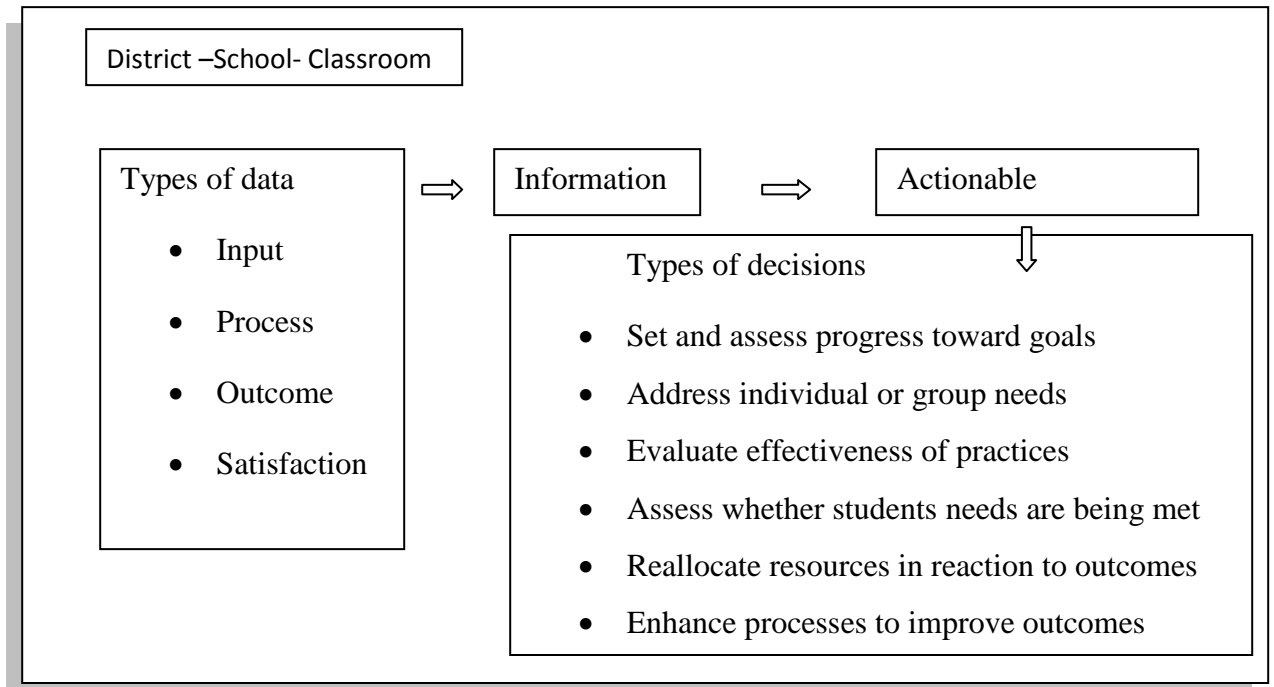
(Deming, 2003; Juran, 1988;Senge, 1990)

This framework also acknowledges that the raw data cannot be used only as it is. It should be organized and combined with an understanding of the situation which is seen as information in the framework. Information becomes actionable knowledge when data users synthesize the information, apply their judgment to prioritize it, and weigh the relative merits of possible solutions. At this point, actionable knowledge can be seen as different types of decisions, such as how to set goals and how to assess whether the goals have been achieved; how to address individual or group needs (e.g. Support for low-performing students), how to evaluate the effectiveness of practices, how to assess whether the students needs are being met, how to relocate resources, or how to develop processes in order to improve outcomes. These decisions generally are seen in two different categories: data to inform for example identifying goals or needs, and data to act like changes to the curriculum or a

relocation of resources. Once the decisions are made, new data should be gathered to assess the effectiveness of those decisions.

The framework also shows that data-driven decision making must be understood in a larger context. First, the types of data vary across levels of the educational system: the classroom, the school and the Ministry. Second, the conditions of all these levels influence the data decision process. For example, the accuracy and accessibility of data and the technical support or training can affect educators' ability to turn data into valid information and actionable knowledge. Without high-quality data and technical assistance, data may become misinformation. For example, data from a classroom test which is poorly aligned with the local curriculum test might misinform teachers about their students' improvement. Third, the process is not necessarily continuous as it is shown in the framework. For example, before deciding on actionable knowledge, there might need to be additional data collection to produce sufficient information for the desired actionable knowledge. Moreover, the interpretation of the educators and the condition of the organization can shape and mediate this process (Honig, 2006).

The framework shows us that data-driven decision making is a new process for teachers and educators in which they should follow several steps. The overall conceptual framework should be grasped or comprehended by the educators involved and they follow some steps. These steps are:

1. Establishing student achievement outcomes and goals and accepting responsibility for them as a school.
2. Identifying important questions that need to be answered regarding these student achievement outcomes and goals.
3. Collecting data to answer the questions that have been posed regarding the student achievement goals.
4. Conducting a purposeful data analysis.

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5. Using the data analysis to create a plan of action and following the plan.

6. Collecting ongoing data on the plan's effectiveness and analyzing the data to evaluate how well the plan is working.

7. Using the evaluation to tweak the plan where needed so that the goal is reached.

Step1: Establishing Student Achievement Goals:

In the first step of data-driven decision making educators should explore the relationships between the situation of the school now and how they want the situation to be different. This is called gap analysis. For example, if 52% of the twelfth graders failed to pass the final math exam it would essential for the school to change that result in the following year. They could want 70% of the twelfth graders to meet or exceed expectations on the final math exam. So, the school needs to identify a goal about final math exams for grade twelve students. The goal must be specific, measurable, achievable, results-oriented and time-referenced (Garmston and Wellman, 1998). Therefore, the goal for the next year will be: 70% of students in grade twelve will meet or exceed expectations of final math exam. This goal is specific, measurable, results-oriented, time-referenced, but it is not directly possible to say that the goal is achievable. The school first needs to examine why 52% of students failed the test. To identify the goal is just the start.

Step 2: Identifying Important Questions:

Traditionally, in data-driven decision making, once a school has identified its goals, the staff often start collecting data. Data usually is stored by the administrators and the teachers, however, often they do not know what to do with the data (Jessup, S., 2007). In order to use data in decision making educators need to ask some

questions. For example, if the majority of the eleventh graders failed the biology exam, the school might ask why those students failed the test; what are the ways the students who failed were different from the students who passed the exam; was there something that could have been done during the instruction process. Asking questions is important in achieving goals. Only by identifying and prioritizing questions can schools organize the information they have available (Mandinach E. B., Honey M., 2008). Therefore, further data need to be gathered in order to answer these questions.

Step 3: Collecting Data to Answer the Questions

Most schools have data available, but they do not know how to use it for instructional improvement. They lack the process to connect data they have with the results they must produce (Love, 2008). This problem can be corrected by focusing on forming questions that need to be investigated and then by deciding what data can be used to answer these questions.

For example, if the problem is the number of failures in the chemistry exam in grade 10, the school should ask why the students failed and what changes should be done during teaching. Then, it is expected that the school would need to acquire more data to find the answers to these questions. The school could collect data on student demographics or formative and summative assessment data. Some assumptions and some predictions about these data will be made.

Step 4: Conducting a Purposeful Data Analysis

After exploring assumptions, data should be analyzed in a reflective way. It is better to divide the data into parts to make it clear. Data should be manipulated by:

- Sorting them into categories.

- Distinguishing one element from another.
- Comparing them with other data.
- Contrasting them with other data.

The school should be able to see the importance of data; see the patterns, categories or trends that are emerging; and also see the unexpected points by manipulating data.

Step 5: Using the Data Analysis to Create a Plan of Action and Following the Plan

Educators should interpret data and use that interpretation to formulate the action plan. For example, if a school is investigating why a majority of grade 11 students failed the physics exam it can create some interpretations from the data and base their decisions on these interpretations. The interpretations might be that their curriculum was not adequately aligned to the Ministry standards, that teachers were not using the same practice materials, or the ongoing assessment was not a good model for the terminal exam. These interpretations would lead the school make some decisions for improvement such as, revising the standards, collaborative planning or revising ongoing assessment tools.

Step 6: The Plan

The action plan should be tightly focused around the data and aimed at the goals of increased student achievement. For example, if a school is investigating why grade twelve students did not achieve well in the English exam, the strategic plan might include some decisions such as, having remedial classes for weak students, having more hours of English, revising ongoing assessment, etc.

Step 7: Collecting Data on the Plan's Effectiveness

After creating the plan, it is important to monitor the effectiveness of everything that is implemented. Therefore, having too many initiatives at once will not be useful. Educators should focus on a few things and then work together as team to make them happen (Love, 2008).

Step 8: Using the Evaluation to Tweak the Plan

Collecting data is never an end in itself. Data must be analyzed and results must be used in a meaningful way to ensure everything the school is doing is on track. By this way, the plan effectively impacts student learning (Jessup, S., 2007).

C. The Systematic Use of Data for Decision-Making

Data-driven decision making can be divided into three functional areas:

1.   collection, integration and dissemination of data;
2.   analysis and reporting of data, and;
3.   process and procedures for acting on the data.

In other words:

(1) purposeful data collection and analysis;
(2) designated resources and other supports, such as time and an appropriate data management system; and
(3) strategies for communicating about the process of data collection and use as well as the findings.

1. **Purposeful data collection and analysis**

When data collection and analysis are purposeful, educators are better able to identify patterns of outcomes and design strategies to enhance student learning. Purposeful data collection and analysis efforts focus on answering questions that is tied to identified needs and goals, as illustrated in the sidebar.

Tying Data Collection to Needs and Goals

Identified Need: Improvement in mathematics functions in grade 10

Goal: By May 2009, 85% of 10th-grade students will perform at proficient levels in mathematics functions as measured by the district math assessment.

Question: How effective is the after-school math tutoring program for the learners?

Considering different types of data, for example, demographic, student outcome, and perception creates a more complete view of student achievement. For example, scores on general tests may help to see how students are doing overall, but examining students' performance on classroom assessment may reveal how students are learning particular skills or topics.

Purposeful data analysis focuses on using data to make decisions about programs and students. To make appropriate decisions about *programs*, data may need to be analyzed over multiple years; to make appropriate decisions about *students*, data may need to be disaggregated, analyzed across classes and teachers, and draw on more than one source (Bernhardt, 2005).

The gathering of data in a school means looking at students, teachers and the school community in many different ways. Test scores alone cannot tell us how and why the students are doing well, or why they are not successful. Using different types of data will give teachers much clearer information to use when examining their daily practice. There are dual measures, three-way intersection and intersection of four measures.

Dual Measures

One category by itself often gives useful information. Used together, however, different measures can provide much deeper insight. Looking at one source of data by two different measures, we see more vivid picture of the school. It allows us to answer questions such as:

- Do students who attend school everyday get better grades? (looking at demographics-input data and output data)
- Do students with positive attitudes about school do better academically? (satisfaction data and outcome data)
- Is there a nationality difference in students' perceptions of the learning environment? (satisfaction data and input data)
- What strategies do English teachers use with students who are low in language proficiency? (process data and input data)

Three-way Intersection

Here are some examples of how three measures can intersect at the school level:

- Do students of different nationalities perceive the learning environment differently, and do they score differently on standardized achievement tests in

patterns consistent with these perceptions? (input-satisfaction and outcome data)

- What instructional process did beginner level students in English respond to best in their English classrooms this year? (satisfaction-input and process data)

Intersection of Four Measures

An example of a question that addresses outcome, input, process and satisfaction data is:

- Are there differences in achievement scores for grade 12 UAE nationals and expatriates who report that they like school, by type of program (are or science), in which they are enrolled?

2. Resources and support

A number of supports need to be in place in order to gather data and use it effectively. One important aspect is to work as a team. It is not possible for a single person to collect and utilize data. Working as a team provides support for improvement over the long run. Also, distributing the work across team members lightens the load of the work of one person. In addition, a team is likely to view data from multiple perspectives, which ensures that data interpretation will be less biased and more complete.

Another necessary support for effective data-driven decision making is using technology infrastructure such as data collection and analysis software, access to the internet and e-mail, professional development for users and equipment maintenance supports the sustainability of improvements by aiding data use over the long term.

Data should be used if a school wants to improve student learning. Using data effectively requires data tools which are student information systems, data warehouses, and instructional management systems. These data tools are required in a school to hand them in whenever a teacher needs to gather data in order to support student progress. It may take some time for the Ministries to send the needed data to the schools. Excellent tools to keep track of data and to ensure that all students meet learning standards are available now; the difficult part is to choose the right data tool for the school itself. Schools should think of what they want the data tools to do, which tools do what they want and which tools they need first.

The districts first purchase a student information system. Schools usually purchase an instructional management system or warehouse management system. Student information systems are databases that collect demographic data such as, class attendance, tardiness, discipline referrals, and enrollments. Data warehouses enable school districts to analyze data across different databases, such as student information systems, databases of test results, and school programs, and databases of information about students' and teachers' perceptions. Instructional management systems help analyze student performance on ongoing assessment and reveal how closely student learning matches the content a teacher has presented in class. Such systems

- Provide standards-based lesson plans and resources to help students and teachers raise test scores;

- Help teachers align classroom curriculum to content standards; and

- Help teachers align curriculum between grades.

The hardware may include secure servers for storage and computing devices for input and output, and a secure network to store and access data. As computing

devices evolve and develop, more options with increased mobility, security, and lower cost may be available.

Data reports can be structured in different ways. Reports need to be timely, tied to objectives, and available to people with the responsibility and ability to act on them. Data reports that show data in different ways such as tables, charts, graphs, and trends enable more people to access and understand the information. If possible reports should include longitudinal data so that teachers, principals, and administrators can compare results over time.

The most useful data report formats to principals are data on attendance, enrollment, student/teacher/parent satisfaction surveys, and test results to assess progress, allocate resources, and create school improvement plans. They look for information that is organized numerically rather than alphabetically, includes objective descriptions of data, visual displays of information, and query tools.

Web-based systems enable teachers to log-in and view a class or a student profile or flexible groupings of students. They can view assessment results tied to standards and assessment items. They have access to current and historical data as well as contact information for student, parents, and email links to other teachers.

3. Communicating about the process of data collection

Involving staff members with data at critical points is very important for the improvement of the staff in using data. Many principals mention useful data in staff meetings. This does not require a lot of time like identifying appropriate improvement strategies. Therefore, there should be a data team which coordinates data collection, analysis, interpretation and reporting, monthly meetings are also necessary.

Given the complexity of collecting and using data for decision making, it is best that the school leadership team not serve as the data team. Nonetheless, at least one member of the leadership team should serve as a liaison to the data team to facilitate communication and collaboration between the groups (Johnson, 2002).

The primary role of the leadership in data-driven decision making is to help maintain respectful, trusting culture in which data can be collected, analyzed and used constructively to increase student achievement. To carry out this role, the team can ensure that not only the data and their implications but also the assumptions about students and the personal beliefs that can affect how data are interpreted. Maintaining a climate of trust and respect helps ensure that potentially difficult or sensitive discussions about data and resulting decisions are productive. In order to establish a culture that supports the use of data, it is necessary to review data continually. By using data more frequently teachers and educators will see the effect of data to make decisions about teaching and learning. This can be done by asking key question of the data team. Some questions can be similar to:

- Do these data give us the information we need?
- What data are missing?
- How can we find the missing information?

School leaders should also revisit how resources for data collection, analysis and use are allocated and make adjustments as needed. For example, the leadership team should periodically review the capacity of the data software program. In addition to this, the leadership team needs to check the ongoing professional development to increase their capacity to analyze complex school data (Mason, 2002).

Perhaps the most important part of data-driven decision making is enabling decision makers to use it. Colorful reports and expensive assessment packages will

have no effect unless they are combined with leadership training and effective professional development. The district needs both organizational and individual capacity for improvement.

- Administrators need training in continuous improvement processes and the opportunity to share ideas with peers to learn how to ask the right questions.
- Teachers and administrators need training to learn how to read data and apply it to their goals and objectives.
- Instructors need training in different instructional strategies to apply, for instance experimental learning, questioning skills, or concept mapping, when the data shows that traditional methods are not working.

And this is just the start.

Educators should begin by organizing the data already on hand, such as student information and standardized test score results. Both are usually in electronic form, so importing the data into a data analysis tool is easy. Next, educators should think about how they can intersect that data to answer questions about program implementation (Bernhardt, V. L., 2003. No Schools Left Behind- Educational Leadership. 60(5), 26-30).

The school should select effective data tools and in order to do that it should be clear what it is looking for. This will enable schools to purchase the system according to their need and not the needs of others. In addition, the school should have a team on data analysis and teachers, administrators, and information management personnel should be included in the data analysis process. The school can also research possible vendors and have them to come to the school.

Data-driven decision making is an on-going process rather than a one-time project. District staff members need to be open and honest about results and have the freedom and responsibility to test and try new strategies for improvement.

Legitimate concerns about assessment tools, data, and curriculum should be acknowledged and addressed as the district refines the process. The result is a common understanding of what goes into the aggregate data and a process for helping each student meet the same standard for success.

Statistical data on school programs and student performance provide educators with our only real evidence of the success or failure of educational programs. Data identifies the link between teaching practices and student performance so that high achievement levels can be obtained (Miller, 2000 in Wade 2001).

Assessments used during the year may be formative assessments used for instructional interventions or benchmark assessments to determine progress against an external measure. It is essential for teachers, principals and others to know what kind of assessment they are using and the proper method of analysis based on the reliability and validity of the measure.

Benchmark assessments tied to the national standards provide quick snapshots of where students are with regard to the progress they are expected to make. Interventions used by educators include reemphasizing skills, utilizing additional diagnostics to get at the root cause, changing instructional materials, and creating cohort groups within schools and classrooms of students who have a similar achievement gap or pattern to apply instructional strategies. Although teachers have always used tests and quizzes to track student progress, these measures did not necessarily relate to standards or the assessment systems did not provide results in a timely manner.

D. Major Misconceptions about the Effective Use of Data in Decision-Making

It is not enough to make data available if the decision makers just build the system and suppose that teachers and principals will use it. The ministry has to have a process in place for analyzing the information and getting it to the right decision maker at the right time with the power and resources to act on it.

Teachers need to know how to analyze data and query systems. By learning to incorporate data analysis as a regular part of their professional activity, teachers become more reflective about their teaching practices, less reactive, less willing to accept easy answers, and more open-minded to solutions based on the data they gather. As a whole, the school assumes a more professional and civil culture of inquiry, in which teachers share with each other important questions and ideas related to teaching and learning (Feldman and Tung, 2001, in Wade 2001).

The ministry can only successfully implement DDDM in the classroom by providing teachers with on-site support, timely reports, analytical tools, and planning teams.

Test scores determine the quality of a school and a student's education. Many factors contribute to the success or failure of a student. Emphasis on test scores can give the community the wrong impression about a school. It is up to the superintendent and principals to frame the discussion so that parents and community members understand how well schools are doing and what they need to do to improve.

E. Major Barriers to Effective Use of Data in Decision-Making

There are many reasons schools do not use data well. First of all, there is a lack of cultural emphasis on data collection in many countries. In many schools and

districts, data analysis has never been viewed as a high priority. Many districts put little emphasis on schools gathering data, and thus provide little incentive for districts and schools to devote time, money and staff resources to using data in new ways. Teachers and administrators do not see data collection as part of their jobs, perceiving it instead as a waste of time. They usually think that they already know the problems since they are at school every day. Also, in schools educators often lack the training, equipment, and time to develop and carry out data analysis. Few people are trained to analyze data. Teachers don't have access to adequate computer resources, including hardware and software, nor would they know how to use them. Many educators also fear data analysis, instead of embracing it as a way to make their jobs easier and more rewarding. They think that data analysis will turn up something they do not want to see, such as evidence of their incompetence. They have seen test scores and other data analyses used to compare their competency with the other educators. For example, a district or a zone may use student test scores as evidence that a particular school should be reconstructed.

Lack of training and interoperability—systems that are unable to share or exchange data are the main barriers to more effective data-driven decision making. The other barriers can be listed as follows:

- Lack of understanding of what to do with the data
- Absence of clear priorities on what data should be collected
- Failure to collect data in a uniform manner
- Outdated technology/legacy systems
- Low quality data – inaccurate or incomplete
- Timing of data collection
- User interface is too complicated to understand reports

These are serious issues that the schools must address in the years to come. But meanwhile, schools can still be using data to provide meaningful guidance on

teaching practice. They do not need an advanced degree in statistics or software systems to start asking data-based questions about their school. They can replace hunches and hypotheses with facts, identify the root causes of problems, not just the symptoms, assess needs and target resources to address them, set goals and keep track of whether they are being accomplished, track the impact of staff development efforts. (Williams, J., Professional Leadership in Schools-effective middle management and subject leadership, 2002)

Section 2

A. The Secondary School for Girls

    a. Data Collection

The first school that I observed is a secondary school for girls in Dubai. It is a Madares Al Ghad (MAG) school. There are 457 students in the school. The principal advisor is bilingual, so that the communication between the principal and the advisor is very good. The advisor constantly helps and supports the principal in all aspects of leadership. They often have professional conversations about the principles of being a good principal.

The principal is highly motivated to assess the school using the data that the school gathers. This year, the principal has an advisor and the advisor states that they have discussed the importance of data in decision-making with the principal and that she was eager to use data in the decision-making process of her school.

However, the principal has not done any data analysis although the school receives data on student performance and the success of her school at the end of each year from the Ministry. The Ministry sends the data to each school without comment. The schools study the data and they will be supposed to use the data to make decisions for the following school year.

The principal and the vice principal only keep data as a record; they do not analyze it. Data which the Ministry sends includes:

- Student demographics

- End of year ongoing assessment and terminal assessment results

- A list of students who got full marks in particular subjects

- Top students according to the levels

- Statistics of nationalities according to passing and failing

- Deviation rates: difference between ongoing assessment and terminal assessment

- Percentage of grade 12 students' passing according to the total general percentage

- Percentage of Emirati students' success in CEPA[2] and line graphs

- Number of students who passed in CEPA in Dubai

- Number of students who passed in all subjects in grade 12 in that particular school and in Dubai

- Number of students in grade 12 in Dubai who failed in one subject or more and their percentages according to kinds of teaching such as general, vocational, special needs, adults and home study

- Number and percentages of students who got <60 in subjects in the zone

- List of students who failed in four subjects including English in all Dubai

- Number of grade 12 students in each school in Dubai

- Percentage of students who passed in all subjects in grade 12

- List of students according to averages

- General statistics for passing and failing according to subjects and teachers

- Final exam result analysis for all grades

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2 CEPA (Common Educational Proficiency Assesment) CEPA was developed originally to facilitate the placement of students for English language study purposes across the three higher education institutions. High school students are entitled to get the exam as their final exam in Grade 12.

- Bar chart of general statistics of passing and failing of all grades

- Analysis of students' passing and failing listed according to the teachers who are teaching to those students

- Analysis of student success according to the classes

- Student deviation rates in all grades

- Class exam results according to teachers

- Grade 12 success rates compared to Dubai (percentage of students passing according to the total general percentage is only available for the school, not for the whole city)

<div align="right">(Appendix 4)</div>

Data should be analyzed over at least three years in order to be more reliable and reflective. In this school, the principal keeps all data that is sent by the Ministry in a file to assess the school. Although the school has student performance data from previous years, the principal had not done data analysis of the previous three years. She has started to look at data last year (2007) and made some assumptions with the help of the principal advisor that she is working with. The importance of data is understood by the principal, but there is no evidence of any data analysis of student performance.

The school itself also collects different types of data:

1. Input data

a. Statistics of nationalities in the school

b. Statistics of students according to their age

    c.   Attendance

   2.   Process data

    a.   Financial operations, expenditures

    b.   The quality of instruction-lesson plans, weekly plans and yearly plans

   3.   Outcome data

    a.   End term and year exam results

    b.   Behavior Marks/ Conduct

    c.   Diagnostic Tests

   4.   Satisfaction Data

    a.   Students Surveys about teachers

    b.   Opinions from teachers, students, parents or the community(informal meetings/conversations)

But the question is how the school collects the data and what it uses it for.

1. Input Data

Statistics of nationalities are collected by the administration because the Ministry is asking for that to make comparison between the locals and non-locals. The Ministry looks at nationalities according to passing and failing. The school does not analyze this data and use it for decision-making (Appendix 5).

Administration receives the ages of the students at the beginning of the year (Appendix 6).

Attendance is taken as a hard copy. One of the staff takes the attendance. She visits all classes in the first periods and asks teachers to write the name of the absent students in the attendance booklet. Then, the vice principal transfers this data into the software program which is an administration program that is used by all public schools in the country. The vice principal says students with more than fifteen absences without a medical excuse will be dropped out from the school. Student who does not go to school ten days in a row receives a warning letter from the administration. The vice-principal adds that the school has not experienced such a behavior so far. Students have many days absent, but they bring medical excuses. School also calls parents of absent students to follow-up. In addition to this, social workers are always in communication with those students who are continually absent. Although the administration says absenteeism is being taken care of, teachers believe that there is no improvement in reducing absenteeism with some particular students.

Teacher absenteeism is also a problem in the school like student absenteeism. The school needs to have a record of teacher absences and for that purpose it uses a software program in which teachers enter their names every morning. This program is checked by the vice-principal daily and documented for future action. If a teacher is absent for more than six days without a medical excuse, school reports this data to the Ministry and the Ministry takes action. At this point, the action is sending a letter to the teacher. Teacher salaries are also penalized after this time period.

Any discipline referrals are not documented and the previous years' discipline referrals do not exist.

2. Process Data

The school uses a hard copy to keep a record of how the school spends the money. The principal maintains that she is planning to but software to implement this change but has had to postpone the implementation because she does not have

sufficient funds. Although the principal believes in data gathering and using it for school improvement, it is not included in the budget since data storage program are very expensive and the school does not have the flexibility to buy an expensive program. If the principal believes that data is very important part of school improvement, then the school should include the funds for data in the school budget. However, there were no changes in the budget this year, and a data program is still not included.

A large majority of the teachers in the school have spent more time writing lesson plans, especially this year (2008-2009). Administration is focusing on lesson plans this year as it is one of its goals. Principal asked teachers to use one lesson plan format for all subjects and she also asked for weekly lesson plans. The principal decided to focus on lesson planning as she noticed the difference between English lessons and the other lessons last year (2007-2008). This data is collected by classroom observations. In English classes, time was used very effectively whereas in other subjects using time effectively was a problem. Principal thinks that having a well-prepared lesson plan is very important to have a student-centered lesson. Therefore, she asked all teachers to prepare detailed lesson plans. Lesson plans are also a type of data that show the quality of teacher instruction in the classroom. Therefore, lesson plans can be an example for input data. Teachers should use lesson plans to evaluate the quality of instruction. This is a new concept for this school. Teachers have recently started to write lesson plans. To use lesson plans as input data to make further decisions is a long-term goal. First of all, teachers should be trained in lesson planning and then, they can start to assess the teaching by the help of the lesson plans.

3. Outcome Data

The ministry has a software program which looks at students' grades in each school and also it compares the school success rates. This data is sent to each school every year. The administration only looks at and stores the data instead of using this

data for future planning and school improvement. Teachers state that the principal receives student performance data, but any analysis and future plans according to that data is not shared with them. The school uses its own software program to keep the record of student assessment. It is a very simple program in which the grades and averages are seen. There is no comparison or any type of charts and graphs used. It is prepared by a computer teacher who is assigned to do this job by the Ministry. The principal wants to develop the program as they encountered some problems in the past years. Some of the data was deleted by the program itself and there were some mistakes in the averages. She also believes that the program is not helpful to distinguish patterns and trends.

Teachers prepare continuous assessment tools in the departments, but end of semester and end of year exams are sent by the Ministry. Therefore, end of term and end of year exams cannot be revised and changed or modified. On the other hand, teachers can do changes and modifications on quizzes and end of unit exams. Most of the teachers do not use the exam results to improve their lesson objectives. They have to complete the curriculum, so the students will be prepared for the final exams. Teachers cannot change the objectives, but most of them try to help to the weak students individually. This does not happen in a structured way like remedial, extra classes or tutorials. There are few teachers who use performance data and evaluate their lesson objectives. One teacher mentioned she looks at the topics that the students have difficulty with and provides students with more materials on that topic.

Data about conduct is stored in the school. It is gathered from teachers by behavior marks. Administration prepares certificates for good conduct. School keeps certificates of every student, current and previous, in a file. The reason for that is some schools in higher education asks for certificate of conduct as an admission policy and graduates can get the certificate from the school.

School does not use a diagnostic test to distinguish levels of abilities and distribute students in classrooms. Only Arabic and English subjects use diagnostic tests to see the level of the students at the beginning of the year and at the end of the year, so that they will be able to see the student progress. Teachers claim that diagnostic tests are used for their lesson plans, but this cannot be proved. Teachers do not make any changes in the curriculum according to the diagnostic exam results. In addition, teachers do not evaluate the progress of students according to the diagnostic tests at the end of the year. Diagnostic tests are only done to get information about students' pre-knowledge and level.

Some data are collected on student background and performance trends. It is known that student learning standards must be identified, but standards are not identified in the school, except English. Some effort is made to track and analyze student achievement trends on a school-wide basis with the help of the principal advisor. However, the principal still does not share student performance data with teachers to create solutions for improvement and also teachers still need assistance in understanding the needs and learning gaps of students.

4. Satisfaction Data

The principal uses a student survey to get data about the teachers which is ready to be photocopied and distributed to the students in the evaluation booklet (Appendix7). Student surveys are done once a year. Students give scores to the teachers out of three. The principal then reads the survey answers; however, the survey is only a small part of the teacher evaluation. The principal does not make any changes as a result of the surveys. It is the view of the principal that students are not afraid of giving their views and are honest while completing surveys. Some survey results of some teachers surprised the principal last year. The teachers whom the principal expects very good feedback received bad feedback from the students

and this made the principal questioned the reliability of the survey and also the honesty and objectivity of the students. Therefore she did not take the survey results into consideration in teacher evaluation. The decisions about teachers are mainly taken according to the class observations and teacher portfolio evaluations.

There are also no questionnaires for parents for school evaluation. The only data about school from the parents are collected in informal meetings between the principal and the parents. There is a parents committee, but it is not asked to evaluate school. The main responsibility it has is to help school in some situations like organization of parents' meetings and organization of school visits.

The principal gets data about teachers by classroom observations and student surveys. The parents' comments are not included in the teacher evaluation. Administration is provided with an evaluation booklet for each teacher. The principal has to complete these booklets every year. The evaluation booklet helps principals with their teacher evaluation process. It also provides principals with information about observation skills, different forms and reports, tools of measuring teachers' proficiency and productivity. The forms that could be found in this booklet are:

- Class visit reports

- Personal visit reports

- Evaluative visit reports

- Teachers' follow-up reports

- Final teacher reports

- Yearly reports

- Reports for new teachers

- Reports for teachers who do not teach

- Application form for a supervisor

- Vice-principal application forms

The principal uses these forms and assesses teachers at the end of each year. The principal usually does not give feedback to the teachers unless there is a negative point about the particular teacher. She only gives informal feedback after the classroom observations.

In the school, teachers do gather data. They feel that they spend more time on getting data about student performance. Indeed 60% of teachers think that they spend the greatest amount of time in preparing and checking the continuous assessment tools- end of unit tests and quizzes, and terminal assessment tools- end of term and year exams. Continuous assessment tools are prepared by teachers in the school whereas the terminal assessment tools are sent by the Ministry on the days of the exams.

On the other hand, 20% of teachers believe that preparing and implementing oral exams is the biggest part of their student performance data collection. Oral exams are prepared by the teachers. The exams are usually one question. Students answer the questions in five or ten minutes. The oral exams used to be done orally as it is the main aim of this type of assessment to assess students' speaking skills besides their knowledge, but two years ago the Ministry asked schools to get students to write the answer of the question on paper as they want to see an evidence of the oral marks which made the exam turned into a written assessment. Oral exam means student oral presentations in some subjects. Teachers are encouraged to use rubrics for marking, but rubrics are not seen in the school for each subject. Oral exams take time because teachers should prepare rubrics and do documentation, and also teachers should arrange extra time during school day for oral exams. For

instance, oral exams are done during recess which does not allow teachers to have free time.

Only two teachers out of twenty-one find giving student participation and behavior marks a very long process. None of the teachers finds the attendance a long process in data collection. Teachers do not pay enough attention on attendance. They do not use a form for that. It is a task that is carried out by the administration and social workers. Teachers only talk with social workers if a student is absent for too many days.

Most of the teachers at the school observe that goals and objectives of the school are based on data obtained and they believe that the school gathers different types of data. On the other hand, there are some teachers who think the school does not use data to identify its goals and objectives.

A teacher stated that data was not shared well in the school. She added that the principal never showed the analysis of student exam results to the teachers at the end of the term and never discussed areas for improvement. In addition, the principal does not share the answers to the student questionnaires. The teacher believes that most of the data is taken because it is asked for by the Ministry or the zone and the data is not analyzed well for school improvement.

65% of teachers believe that decisions are taken in the school by the help of data obtained, but the rest thinks that decisions are taken spontaneously, just to solve the problem at that time.

The majority of teachers, 80%, see themselves as part of the decision-making process. The principal usually asks for the teachers' ideas and opinions. She leads weekly meetings where some decisions are taken together. Although the

administration usually asks for teachers' ideas and opinions, it rarely does what is decided in the group. The principal advisor and the principal usually take decisions together and inform teachers later. They do not take teachers' ideas and opinions into consideration. Furthermore, teachers believe that they are informed about some decisions late. A teacher says she does not know some of the decisions unless she asks about it to the administrators or to the other teachers. She adds she sometimes gets the information from the students.

Many teachers use student performance data to revise their lesson planning. They take decisions according to exam results. They add some extra activities for the parts in which many students achieved low marks. In contrast, some teachers believe that they just follow the curriculum and that they cannot make changes according to the student performance data. They think they do not have time for that because the school year is not long enough to cover the curriculum and have some additional classes.

Teachers also say that they look at student performance data to identify the student needs. Most of the teacher use data for that reason, but they add that it is not easy to change or add some extra classes into the curriculum. They do not feel that they are flexible. They always have the idea of completing the curriculum because the terminal assessments are not prepared by them, so they should teach the students all the topics that is asked to be covered in the yearly plan.

Some teachers are aware of the importance of data-driven decision-making for school and student improvement, but they also feel that the school does not pay enough attention on that or use data appropriately. They know that school needs to have some changes in using data. First, they want to see clear surveys to get accurate information from the students. Second, they believe that teachers are not updated about some data and they would like to be updated more often about any kind of

data. Then, they would like to see decisions to be checked and their effectiveness to be measured.

Teachers do not share student data with the colleagues. There is teacher communication by emails, but student data that they gather is not seen in the emails. There is also no discussion board for teachers. All these can become real if the school is supported economically as well. The reason for not sharing student data might be related to some cultural facts. Teachers do not want to show their student performance data because they think that data can be used as a proof of their incapability. Teachers also may not know how to analyze student performance data.

b. Professional Development

Teacher training is also important for using data in education. The principal advisor encourages the principal and the teachers to use data, but training is lacking. Therefore, training for using data should be planned. The principal has not attended any workshops or conferences about using data in education or data-driven decision-making. However, the principal in this school looked at the importance of data in education with the principal advisor. They had weekly professional development sessions last year and one of the topics was using data in schools. The principal advisor maintains that the principal understands what data-driven decision-making is and why it is important for schools. She started to look at data this year, but still she needs to obtain the habit of data analysis and decision making according to data. The principal still collects data for administrative purposes such as filling in forms for inspections rather than gathering data for school and student improvement.

The principal advisor also worked with the social workers (student counselors) last year. The advisor did mentoring and one of the goals that she had was to make the social workers work with data. She helped the social workers in

gathering data, such as preparing surveys and communicating with parents. Gathering data by using different tools was not easy for the social workers in the beginning. They even decided to transfer themselves to another school for the following year because of the heavy workload. However, by the end of last year the principal advisor reported that they were feeling more confident about collecting data. Social workers prepared a form which is called a Student Information Form (Appendix8). Parents are asked to fill in this form. The form provides the school with the necessary personal information of each student which may be used to solve problems such as misbehaving, low marks and absenteeism. The information asked in the form is:

- Religion

- Nationality

- Date of birth

- Residence area

- Parents' work details

- Number of brothers and sisters

- Student health information

- Student hobbies and talents

In-service professional development programs do not take place very often. There is a committee which is for professional development. One teacher is responsible for that and the teacher plans sessions and prepares certificates. This year there is more professional development because of the inspection that is going to take place. The inspection will grade the school and give detailed feedback about the education in the school. The inspection is done by outsiders who are sent by KHDA

(Knowledge and Human Development Authority). The principal wants the school receives very good feedback in all aspects of education, so she encourages strong teachers to share their knowledge with the others. The principal chooses the presenters according to the classroom observations that she had in the past years. Asking teachers to list their professional goals is a good way for teachers' improvement, but there is no data collected from the teachers about their professional goals in the school. The principal only asks departments to write down their strengths and weaknesses, but professional development sessions are not prepared according to that information. Only English department has teaching workshops and mentoring because the school is in a project called Madares Al Ghad. Teacher mentors and leaders work with teachers all the time and are asked to prepare weekly professional development sessions.

c. Decision-Making

Team work is strong in the school. There are regular weekly meetings and group decisions are taken in these meetings. Those decisions are mainly about lesson plans, but data is not used to make any changes or any adaptations in lesson plans. Decisions are usually taken at the end of spontaneous and informal conversations between teachers. Data is seen as an administrative task most of the time. Teachers are asked to fill in reports about students, fill in the exam result tables and give oral and behavior marks, but they do not use them for the student learning progress.

Decisions are made in teams in the school. The principal and the coordinators have meetings and make decisions together. As one of the coordinators says, steps of decision-making are applied in the school. She says the problem is discussed in teams. Teachers are asked to have input for solutions and changes are made according to the teachers' opinions. Solutions are tried and additional changes can be made after the trial. For example, the coordinator stated that timetable had been changed three times this year. This happened because of some complaints from some

teachers. New timetables were followed, but they needed to be changed three times to get it right. On the other hand, teachers do not believe that decisions are made by following steps. They think that decisions are made because the administration wants them to happen.

Teachers do not have any role in choosing the course books since they are used in all public schools. However, teachers are asked to develop teaching materials by the administration and they give a list of what the department needs for better teaching and learning at the beginning of the year. The school arranges the budget and provides the departments with their needs, but teachers say they usually do not receive what they ask for. Teachers believe that they do not have any influence on decisions about establishing school budget priorities. A teacher says administration asks for teachers' needs, resources and materials, but usually it is difficult to purchase what is asked for. She says school has good resources with the help of MAG support. For example, MAG provides classrooms with data show projectors, computers, different types of educational resources and books, but the resources that MAG provides are limited to the English department because English is the priority for secondary schools this year. Other subject teachers require teaching resources from the administration, but they think they do not have any influence on choosing teaching resources in the school. On the other hand, they can use the technology in the classrooms provided by MAG. MAG also provides the school with classroom and library furniture.

School improvement planning is done by the administration with the help of the department coordinators. They work on the school strategic plan together and a coordinator says they have the training for strategic planning. The principal provided the training two years ago to all teachers, however only Coordinators have access to any information about the school's strategic plan. Teachers feel uninformed and do not see themselves as part of the decision-making process in administrative issues.

B. The Secondary School for Boys

a. Data Collection

The second school that I gathered data from is a secondary school for boys in Dubai. It is a small school with 250 students. The principal was transferred to the school this year after the previous principal resigned. The school is a part of Madares Al Ghad project like the girl school that I observed. Therefore, the principal is assisted by a principal advisor. However, since the principal does not speak English and the advisor does not speak Arabic the communication between two is very difficult and as a matter of fact limited.

1. Input Data

Attendance is important in the school. It is done as a hard copy, then principal advisor or the secretary transfer the attendance sheet to a computer. The school is using the same administrative data system with the other public schools as it is sent by the Ministry. The rules are set by the zone. It is a general process for every school. If a student is absent for three days, social workers send a warning letter to the parents or give it to the student. When a student has ten days in a row or absent for fifteen days in a term, he will be dismissed from the school.

Nationalities and ages are recorded, but not used for any purpose. The school gathers the data because it is a requirement of the Ministry.

Discipline referrals are not collected in the school. The administration says they keep a record of the disciplinary issues, but the previous years' records cannot be found in the school.

2. Process Data

The budget is prepared by the principal and the vice-principal. Coordinators are asked to list their requirements, but usually the school does not provide the requirements because of the limit o the budget.

Process data such as quality instructions can be kept by teachers. Documenting lesson plans are a part of data storage. However, in this school teachers do not write lesson plans. They use their teacher books to follow. They do not emphasize any parts of the lesson to be improved or changed in any document.

3. Outcome Data

In the boys school; student performance data is not analyzed at all, it is only transferred to the software program in order to get the report cards and send the data to the Ministry.

The database system is done by the computer teacher of the school. It is a very simple sheet that shows end of term marks and averages. School has been using it for several years. Results are sent to the Ministry and the Ministry sends analysis on the data. The Ministry sends the same types of data that is sent to the girls school (.demographics, comparison of exam results between grades, comparison between schools, pass and fail ratios according to the subjects and teachers). This data is not shared with the teachers in the school. The principal and the vice principal do not simplify the data by using charts or graphs in order to evaluate and use it in further planning. Therefore, they cannot see the patterns in the provided data.

The principal says he looks and evaluates the student performance data, but there is nothing to prove that the school management analyzed the data of the last

year (2007-2008). No document is found in the school that shows the student performance data was examined by the principal. Neither decisions nor changes were made in accordance with the data of the previous years student performances. The consequences of the data of the last year cannot be seen in the strategic plan of the school, so the administrators do not have any analysis after receiving the documents from the Ministry. They keep the documents as a record. They only check the passing and failing rates. The principal focuses on the names of the teachers who have the most failed students in their classes. He uses this data as an evaluation tool, but does not make any decisions about teachers related to the low student performance data in his classroom.

The school also looks at data of how many students failed from one subject. The management looks at those subjects and teachers. Then, it examines if the assessment is indicative of student performance. In the school, the principal advisor says students usually fail in English subject. The English coordinator indicates that the administration asks English teachers to prepare reset examinations to pass the students. Last year, as he mentioned, they had to give students who failed only in English a reset exam and they were told by the authorities to make the exam easier for the students to pass.

In the school, there is no common template for keeping record of student exam results. Teachers are free to use their own record system. The template is decided in departments, mainly a spreadsheet or a document is used, and each subject uses its tool to record student performance data. The distribution of percentages of exams are prepared by the Ministry and used over zones. Teachers enter the student marks into the school's administrative program. The program shows the student performance in term 1 and in term 2; it also shows the average of two terms.

The principal advisor says that test results drive teacher instruction in some way in the school. Teachers look at the student marks and inform the social workers about weak students. It is social workers' job to help to those students. This process is not structured. It is more like an informal conversation between the social worker and the teacher. Teachers are not asked to check the performance data and do necessary changes or additions in their planning. Some teachers are willing to do work on performance data and help students to get higher marks by providing them with some remedial or extra work. However, this is not a common habit of all teachers in this school.

4. Satisfaction Data

The school uses the same questionnaire which is used in the girls school for student satisfaction, but this school chooses five to ten students from each class and asks them to answer the questionnaire. After getting the questionnaires done, the principal examines them. He says he does not share the information with the teachers and also he does not use this data alone as a teacher evaluation tool. More important tool is the classroom observations that are done once in a year by the principal. The principal gathers data in the classroom and fill in the form about the classroom observation. The principal mentioned that no teachers so far are asked to transfer to another school because of the results of classroom observations.

The school does not require any satisfaction data from the parents. There is no questionnaire given to the parents about the education in the school. Parents are not involved in any activity in the school. The principal says that there is a Parents Council, but neither the principal advisor nor the teachers witnessed any parents meeting where ideas, opinions and suggestions about school improvement were discussed. Moreover, teacher-parent meetings do not exist in the school. Student improvement is also not discussed with the parents. Parents can visit the school and

talk to the teachers any time they want. Teachers are not entitled to parent meeting times.

Using questionnaires for school improvement is a new concept for the school as the advisor says. He is planning to implement a student satisfaction questionnaire and he wants to prepare the questions with some students. He knows that there is a student council in the school, but it is not active. Therefore, the principal advisor decided to meet with the council and develop a questionnaire together in order to discuss issues about the school. The advisor wants to work with the students to make the questionnaire more relevant. The questionnaire will include different areas for improvement. Students will be able to express their feelings about the environment of the school, education in the school, etc. They will also have the opportunity to make any suggestions. The questionnaire is under process and it will be prepared and distributed in two schools in the country this year. The advisor also wishes to prepare one questionnaire for the parents, but he says it is difficult to accomplish both goals this year.

In the school, teachers gather data in different ways. Attendance is usually recorded by the administration. Teachers think that attendance is important to follow, but only one out of ten teachers keep a record of the attendance for his classes. The majority of teachers, 80 %, say that they spend most of their time checking exam papers and writing report cards. Only 20% of teachers believe that giving oral marks to the students take the longest time of their work. Oral marks are usually given according to the student projects. Teachers also have to give behavior marks to each student, but they do not have any criteria for that type of assessment; they grade students according to their general attitudes towards the lesson without using a rubric or a checklist. Most of the teachers think that they spend a lot of time thinking about their teaching although they usually do not write detailed lesson plans.

Half of the teachers say that they use data to revise their lessons. The other half finds it difficult to plan and change their plans after seeing the student performance data. They say they do not have time to make many changes in the way of their teaching because they have to cover the curriculum for the students to be ready for the final exams.

Half of the teachers agree that administration uses data to identify the educational goals and objectives. The principal says they look at student performance data and discuss the ways of improvement within departments. However, the principal advisor says he has not seen any objective decided according to the previous years' student performance results.

Some teachers believe that data is shared among teachers, but the majority says data is not shared and discussed in the school.

b. Professional Development

The advisor was not able to have any professional development sessions with the principal about data-driven decision-making although it is one of the MAG project's goals. The reason for this is mainly the difficulty of communication between the principal and the principal advisor because of speaking two different languages. In addition, the principal has not attended a workshop or a conference about using data for school improvement. The principal says most of the training he has had is on administrative and bureaucratic issues.

The school is not supported with any training and software data storage programs. Neither the administrative staff nor the teachers are provided with any training on data-driven decision-making or to use data for student and school improvement.

The principal advisor mentions that there is a data driven management
training course around the country for some principals. Those principals have a
certain level of English and they are entitled to take this course and the principals of
both schools that I observed had not attended this course.

c. Decision-Making

The advisor says teachers deliberate on decisions. Decision-making is a long
process in the school. Teachers want to express their feelings and opinions about any
problem or situation. This can become an obstacle because there will be a lot of input
from the teachers and creating solutions for problems could take time. The decisions
are usually taken in the coordinator meetings. The principal and the coordinators
meet once or twice a week. And any decision is shared among departments the
principal maintains. However, the English coordinator does not agree with this. He
says that teachers are mostly informed later than expected. It is a common thing in
the school to learn things late. For example, teachers may be informed about a
meeting on the day of the meeting or any changes in the timetable might be told to
the teachers on the day that the new timetable is implemented. He adds that the
decisions are made by the administration without discussing it in groups.

Most of the teachers in the school think that management makes decisions
according to the data gathered. Even so, some teachers feel that the management
never makes decisions after examining the data. They feel decisions are taken
without searching for the reasons for the problems. Moreover, half of the teachers
state that they are not involved in the decision-making process. Decision-making is
done by the management itself. Teachers are often informed at a later time and there
is lack of communication in the school. There is no communication system like using
e-mails. Most of the time coordinators transfer the information to their teams.

Information is not always shared with all teachers. If there is an announcement from the Ministry or from the zone, it is displayed in the teachers' rooms.

Teachers, who agree that they are part of decision-making in the school, say the steps for decision-making are followed. These teachers are mostly coordinators. They meet with the principal weekly and discuss issues and come up with decisions. Anticipated reasons and some solutions are discussed in the meeting as one coordinator says. The coordinator, however, adds that any follow-up of the solutions does not take place in the school because of lack of time and pressures of work and it shows that the decision-making process is not done appropriately in the school.

Most of the teachers think they have influence on school improvement planning. They say they feel comfortable talking to the principal about their ideas and opinions for better results. Coordinators help administrators to complete an improvement plan which is called the strategic plan in the school. However, the teachers and coordinators have not received any training on strategic planning in this school compared to those teachers and coordinators in the girl's school.

Teachers say that the principal asks for teachers' needs, however, they cannot be provided with the resources that they ask for. Teachers believe the reason for that is related to financial issues.

Section 3: Recommendations

Overall, data-driven decision- making is least effective in all aspects for both schools where I carried my research according to the continuum below.

Least effective	Somewhat effective	Most effective
Purposeful Data Collection and Analysis		
Data collection is not aligned with identified needs and goals. Different types of data may be collected, but the focus of data collection is primarily on student outcomes. Data analysis focuses on measures of student achievement over time. Achievement data are disaggregated.	Data collection is aligned with identified needs and goals. Data collection includes several forms of student outcome data but limited amounts of data. Multiple measures of student achievement data are disaggregated and analyzed over time. Different types of data may also be examined but not in combination with other types of data.	The purposes for data collection are clearly stated, and data collection is aligned with identified needs and goals. Appropriate amounts and types of data are collected. Different types of data from a variety of sources, including disaggregated data, are examined over time, alone and in combination.
Resources and Supports		
A data team is not in place. Some technology may be available to support data collection, but no training is	A data team exists and meets on a regular basis. Time is provided for the team to meet. Limited training and technology to	Data structures and processes are in place, including a data team, adequate time, appropriate technology, and training.

provided.	support data collection and analysis are available.	These structures are viewed as permanent, revisited regularly, and revised as necessary.
Communication		
Communications about data are sporadic and intended only as 'information dissemination', not for the purpose of discussion and improvement.	Communications about data occur on a regular but limited basis. Communications are mainly for providing information, but there are some opportunities or stakeholders to participate in discussions about data.	There are clear communications about all aspects of data collection, analysis, and use. Communications about data occur on a regular and timely basis. Communications include discussions that provide opportunities for stakeholders to participate in the decision making process.

Mid-continent Research for Education and Learning (McREL), 2003

So, in both schools there need to be some developmental plans to use data effectively in decision-making. Here are some recommendations:

	School #1 (Girls)	School#2 (Boys)
Input Data • **Attendance**	• There should be class notebooks and every teacher should take the attendance for each lesson. By this way, students will take	

• **Demographics**	attendance more seriously.
	• Consequences of being absent should be told to the students at the beginning of the year. This will make students be more careful about absenteeism.
	• School should study the nationalities according to passing and failing, as it is statistically documented in the Ministry.
	• Teachers should be informed about student ages. This data will be useful for teachers. It will show the reason of some misbehaviors or student success.
	• Discipline referrals of students also should be collected and recorded during the whole high-school education.
Process Data • **Budget** • **Instruction**	• Teachers should be more involved in the budget. Administration should take teachers' needs and requirements into consideration. It should also get some help from outsiders because the Ministry does not provide the schools with the amount they ask for.
	• A computer program should be introduced to the schools for organizing the budget.
	• Teachers should document the yearly, weekly and daily plans. By this way, absent teachers'

	classes can be covered effectively; students will not miss any lessons. The documentation of lesson plans is also useful for the coming years. Teachers can evaluate the lessons and make necessary adaptations into the lessons by reflecting on the previous lesson plans. That way teaching and learning will be improved continuously.
Outcome Data • **Student Performance Data**	• The principals should analyze student performance data that the Ministry sends because the data can be very useful for school and student improvement. The schools could use the data for self-assessment. They will see the patterns and the trends by evaluating the data, and eventually the strengths and the weaknesses will be identified. • The principals should also share the data with the teachers. Outcome of the data should be used to identify the goals and the objectives of the school. • Teachers should have criteria for any type of assessment. For example, there should be rubrics for oral exams, classroom participation and behavior marks or student projects. • Diagnostic tests also should be used in every

	subject and they should be used for tracking student progress. • In both school, learning standards should be identified and therefore student performance data should be compared to the standards.	
Satisfaction Data	The student questionnaire should be revised and necessary changes should be made in order to get relevant results about teachers.	The student questionnaire should be done school-wide. Letting some students complete the questionnaire will not give relevant findings. Principal should apply the questionnaire to all students and then analyze the findings for school improvement.
Training	Administrators and teachers should be trained in data collection and analysis. If data are to provide meaningful guidance in the process of continuous improvement, teachers and administrators require professional development regarding data analysis, designing assessment instruments, implementing various forms of assessment, and understanding which assessment to use to provide the desired information. As the education of teachers and administrators in assessment and data analysis has	

been weak and nonexistent, educators must have generous opportunities to acquire knowledge and skills related to formative classroom assessment, data collection, data analysis, and data-driven planning and evaluation (National Staff Development Standards: Data-Driven).

First, the principal should be trained in data-driven decision-making. Besides, principal coaching or consulting can be a good idea for principal improvement. Teachers also need trainings in using data for decision-making. For example, in one training teachers should learn how to collect data. This training should include identifying goals and formulate essential questions around the goals according to school data, identify what data they need to collect and create a plan to collect data. In this training, teachers also should study different types of student assessment techniques, using rubrics and other assessment tools as teachers in both schools need that information. Teacher coaching can be also useful for teacher improvement. Coaching is already being done in both schools. However, the way it is done should be examined and improved if necessary.

In another training which can be useful for data-driven decision-making, the principals and teachers will analyze data by:

	• Sorting data into categories
	• Displaying data in meaningful ways
	• Distinguishing one bit or element of data from another.
	• Comparing and contrasting with other data.
	• Noting any important points that stand out as they look at data.
	• Noting patterns and trends that the data shows.
	• Noting anything that the data shows that is surprising or unexpected.
	In this training, principals and teachers will use data analysis to make inferences and interrupt the data, so they can use interpretations later as part of the planning process. Principals and teachers should also be able to share their assumptions and reflect on them, generate questions that they hope the data will answer and create a plan to analyze the data.

As I mentioned above, student performance data should be analyzed in both schools. However, neither of the schools have looked at the data and discussed the opportunities for improvement. For example, when we look at students' performance data of last year (2007-2008) in the secondary school for girls, it shows that the main problem is the difference between ongoing and terminal assessment in some

subjects. This outcome should have led the principal to take action, but the principal did not use the data for any reason. The principal should have analyzed the data and after the analysis she should have revised some points such as:

- The quality and the content of ongoing assessment

- The quality of exam observations

- Standards of subjects and the relationship between the standards and ongoing assessment.

In order to identify these points, there should have been a meeting with the teachers where the data was shared and the reasons were discussed. In addition, an action plan to make the difference between two assessments less should have been made during the meeting. The first step in the meeting should have been writing a measurable goal like 'there must be a difference of 15% between exams and ongoing assessment'. The next step should have been to ask questions such as why there is a difference between the results of ongoing assessment and terminal assessment. Then, in order to answer these questions teachers and administrators should have gathered more data on this aspect, for example student demographics or evaluation of internal tests and quizzes. After gathering some other data, a data analysis should have been conducted. In this analysis, data might have been sorted into categories, or compared with other data. At this point, multiple measures could have been used. Finally, theories should have been discussed and a plan should have been prepared among teachers and administrators. The plan should have mentioned that the content and the format of the exams should be revised. It should have also stated that how teachers monitor the exams should be inspected.

Above all, the administrators in both schools should make some changes in the management as well. First of all, administrators should respect and value of data analysis as an increasingly important tool in education (Wade 2001) and should help by providing the resources necessary for their staffs to engage in it as a team effort.

Second, administrators should encourage and support team work to discuss the data and develop solutions. Data collection and analysis must grow out of a common recognition of the potential benefits statistical data can have in helping to achieve common goals (Wade 2001). Therefore, principals must foster and support this team approach with the commitment of time and resources.

However, it is also important for principals to monitor the process not only in administration but also in individual classrooms. Therefore, principals need to know what good instruction should look like in the targeted areas.

One way to develop this awareness is through the use of principal coaches. Madares Al Ghad has been trying to use this way for two years. Principal coaching is very beneficial in the girls school since the principal shows understanding of the most important principles of good a principal and effort on implementing those in the school. Being bilingual helped the coach (the advisor) to support the principal in the process. The coach helped the principal in many fields such as conducting effective classroom observations that support the school's goal, giving meaningful and supportive feedback to the teachers after observations, using data in problem solving and decision-making, team work, conducting a schedule which fosters instruction, and dealing with the community. In the secondary school for boys, the situation is different. The coach does not provide the principal with any professional development because he is not bilingual.

In both schools there should be more professional conversations between the principal and the teachers. These conversations are an important part of instructional leadership. To be successful, school leaders need to engage in conversations with teachers, using assessment data to diagnose strengths as well as areas in which teachers need to modify their instruction (Hawley, 2006). The principal should know the point of these conversations is not to assign blame, but rather to focus everyone's attention on student achievement goals.

Consequently, the principals should foster a climate where their staffs feel free to explore the data. Teachers in the schools do not feel free to examine and share data with others because they see the data as an evaluation tool for their teaching performance or they see collecting data as a burden, not an asset. One reason for this might be collecting performance data and evaluating it is done at the end of the year in a summative fashion. The data should be gathered and evaluated more often in a year, so that teachers will not feel as if they are blamed or checked. The principal should create a collaborative culture in which data and ways of improvement is discussed.

In order to use student performance data for school and student improvement the school should have carefully targeted, goal-oriented, short-term efforts aimed explicitly at getting measurable, substantive results quickly. However, in both schools except English subject, teachers do not use standards in planning and assessment because student learning standards are not identified in other subjects. That's why there is a big difference in the rates of success between ongoing assessment and terminal assessment done in girls the school. Teachers prepare assessment tools according to the course book without using any standards and in the terminal exams there are different types of questions that are not practiced with students in the class.

In conclusion, data-driven decision-making is an important tool for educators to use as they investigate the relationships that exist between the way things are now and how they would like them to be, uncover their assumptions and deal with them in a positive non punitive way, focus on the same data sets and come to a collective agreement on what the data mean, agree to a course of action and be honest about what it will take to turn that plan into a reality, direct and structure the types of professional development that will most impact student achievement. However, data-driven decision-making is not seen in both schools. Data is not used for self-assessment and for better instructions. The principals are not aware that data

will be very helpful for the school to improve consistency in teaching and to improve student learning. If both schools constantly analyze what they do and adjust to get better, student learning will improve. Below are some necessary points that those two schools as well as the Ministry should consider to implement data-driven decision-making:

1. The Ministry and the schools should establish commitment to data-driven decision-making. There should be new policies and strategies to ensure that all necessary resources and support services are funded and implemented to guide planning and related instruction through use of student assessment information. School leadership must understand that as result of student assessment data, learning will occur.

2. There should be a common curriculum and standards around the country and students should be taught and assessed towards those standards.

3. There should be measurable instructional goals in both schools.

4. Different types of assessment should be made to determine the extent to which students attain the standards and also to plan for individual needs.

5. Ongoing assessment will help teachers to identify a gap or area where students at the schools are generally not meeting the standards. Other assessment strategies that these schools can adopt to enable data-driven decision-making for the purposes of classroom and student level instructional planning are:

   - Locally developed performance tests

   - Rubrics to judge student performance

   - Teacher-assigned grades assigned based on guidelines that reflect national standards

6. In both schools, instructional units and lessons based on data-driven decision-making should be developed. In order for data to influence instructional practice the teachers in these schools must continuously monitor assessment data and other information relevant to student performance and translate that information into the delivery of curriculum and instruction.

7. Both schools need to consider the information about student demographics. The use of student performance data alone is not sufficient to design instructional plans for individual needs. Student demographics such as socioeconomic status, achievement motivation and other behavioral indicators, parent involvement and attendance should be considered.

8. The principals and the teachers should be open to change. Teachers should use data to inform pedagogical modifications and actively seek out more data to judge the success of those changes. Principals should facilitate school climates where it is professionally and emotionally safe to look at student data. Data should be used to highlight the strengths of the schools rather than to identify weaknesses. A needs analysis should be done in both schools.

9. The principals should support teachers with appropriate training opportunities.

10. All kind of data need to be transparent in both schools. Parents also should be able to access data. Some ways of sharing data with parents and with the community are newsletters, flyers, notes home, e-mail newsletters and school websites.

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