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Data-Driven Schools: Are we there? The Case of Lebanese Private Schools

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Abstract

The purpose of this study was to investigate the degree a sample of private school teachers adopted a data-driven approach in their classrooms. Beyond assessing students and collecting their scores on tests and exams, the aim was to investigate what teachers did with such data for the purpose of providing better learning opportunities for their students. As such, a random sample of 213 school teachers completed a survey. The survey consisted of 20 items and utilized a four-point Likert scale. Teachers came from 76 schools located in both Beirut and Mount Lebanon governorates. Data was analyzed statistically using SPSS 21.0 for windows. Findings provide a relatively gloomy image of how data is being used in school for the purpose of informing the repertoire of teaching practices and hence impact student outcomes. There is a heavy focus in schools on assessment of learning yet little emphasis on assessment for learning.

Keywords: Data-driven instruction, Teaching and Learning, Assessment for Learning, Assessment of Learning, Teacher Training.

1. Introduction

1.1 Overview

Data-driven teaching and learning has received a lot of attention in the literature of educational improvement endeavors (Van Geel, Keuning, Visscher, & Fox, 2016). It can provide a snapshot of what students know, what they should know, and what can be done to meet their academic needs (Vanhoof & Schildkamp, 2014). Studies have shown that while there is a big tendency to collect data pertaining to student assessment and achievement in schools; there is little they do with such data apart from judging students and making decisions about promotion to higher grade levels (Yan & Cheng, 2015).

Teachers have noted that they faced difficulties in making use of data because they lacked the appropriate professional development that aided them in doing so (Mandinach & Gummer, 2013; Wayman, 2005). Thus, data usage "continues to be a stress-inducing, learner-centered pedagogical paradigm shift for which most teachers are underprepared…" (Dunn, Airola & Garrison, 2012, p. 88).

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1.2 Purpose of the Study

The purpose of this study was to investigate the degree a sample of Lebanese teachers from private schools in Beirut & Mount Lebanon utilized data in their classrooms; particularly to inform instruction their repertoire of teaching practices. Besides, the study attempted to examine teachers' beliefs about the value data usage in enhancing the quality of learning opportunities they offered for their students. Consequently, this study attempted to answer the following research questions:

1- How is data being used in schools?
2- To what degree are teachers professionally trained to embrace data-driven instruction?
3- What beliefs do teachers hold regarding the added value of data usage in the school?

1.3 Review of Related Literature

1.3.1 Data-Driven Classroom

Lai & Schildkamp (2013) defined data as the 'information that is systematically collected and organized to represent some aspect of schooling' (p. 10). Example include assessment data, structured observation data, and student survey results. When such data is analyzed and interpreted and used to adjust lessons accordingly; studies have shown that better quality of educational offerings can be made available (Madinach & Gummer, 2013).

The literature suggests two paths through which the use of data can lead to incremental improvements in quality of education: (1) improving the quality of decisions made; and (2) strengthening the mechanisms available to monitor progress and motivate responsiveness (UNESCO, 2013; Jacob, 2017; World Bank, 2018; Prenger & Schildkamp, 2018). That is to say, student assessment data can be employed by teachers in making better decisions pertaining to students and their learning; as well as support them in carrying out the processes of monitoring and evaluation in more systematic ways (Jacob, 2017; Prenger & Schildkamp, 2018). Student assessment data can support teachers in adjusting their plans to better meet students needs and can indicate where instruction needs to be improved to enhance student learning (Gelderblom, Schildkamp, Pieters, & Ehren, 2016).

Despite all benefits that the literature indicates, teachers use tests customarily to monitor their students' progress and knowledge and skills, and less often to make decisions about their own instruction (Vanhoof & Schildkamp, 2014).

1.3.2 Teachers' Usage of Student Assessment Data

Figure 1 presents the inquiry cycle that teachers often follow to make advantage of student assessment data (source: Timperley, 2014). Teachers identify the knowledge and skills that their students lack. They then identify what they need themselves to do in order to meet those needs. Next, they deepen their professional knowledge and refine their skills in order to meet the demands of engaging their students in new experiences that would help them cater for the gaps identified earlier. Finally, teachers need to analyze the impact of their interventions on students' outcomes so that they would be better able to respond to students' needs in the next cycle.

Figure 1. Inquiry Cycle of Teachers Using Student Assessment Data
(Source: Timperley, 2014)

The bottom line is that teachers need to be able to collect, read and understand the data they have collected. They might need some situational professional support in order to be aided at data grasping, analyzing and interpreting in light of the intended learning and associated curriculum achievement standards. Structured learning conversations with colleagues and also students can lay a critical role in leveraging teachers' abilities at handling data so that they could distinguish clearly what students know, understand and can do, what can be inferred from the evidence, and what needs further investigation in order to make a confident judgement (Timperley, 2014; Vanhoof & Schildkamp, 2014; Prenger & Schildkamp, 2018)

1.3.3 Barrier to Data Usage by Teachers

Unfortunately, many studies have indicated that teachers often make decisions based on gut feelings rather than making advantage of student assessment data which they collect (Ingram, Louis, & Schroeder, 2004; Earl & Katz, 2006; Schildkamp & Kuiper, 2010; Vanhoof & Schildkamp, 2014; Prenger & Schildkamp, 2018).
The literature indicates that data usage by teachers is hindered by several factors on top of which comes the perceived pressure to stay on pace; which necessitates them to follow the curriculum rather than data (Jacob, 2017). So even when data is available, because teachers are strictly followed up by their seniors to adhere to time tables prescribed by them for chapters and units, they find themselves unable to use such data.

Another barrier to data usage to inform instruction is the lack of professional development that aids teachers to do that (World Bank, 2018). While teacher training programs tend to focus on assessment of learning, little attention seem to be made to enhance teachers' abilities at handling assessment for learning (Prenger & Schildkamp, 2018).

Besides time constraints and the lack of appropriate professional development; the literature indicates that a major barrier for data-driven instruction has to do with teachers' views and beliefs about the added value data can bring into their repertoire of practice inside their classrooms (Gelderblom et al., 2016).

1.3.4 Data Driven Instruction and School Improvement

The literature underscores the effect utilizing data at informing instruction has on school improvement endeavors (Lai & Schildkamp, 2016; Penuel & Shepard, 2016; Bernhardt & Hébert, 2017; Bowers, 2017; Prenger & Schildkamp, 2018).

Schools should analyze four types of data in order to secure improvement: (1) Demographic data; (2) Process data; (3) Achievement data; and (4) Perception data (Bowers, 2017). Demographic data includes descriptive information about the school community members, such as enrollment rates, attendance charts, gender, SEN students graduation rate, etc (Demie, 2013). Process data, on the other hand, has to do with the practices and procedures schools use in order to plan, deliver and monitor the curriculum, instruction and assessment (Demie, 2013). Achievement data provides information about what has been learned by students (Demie, 2013). It includes formative assessment data as well as summative scores.

Finally, perception data pertains to information gathered about the viewpoints held by school community and stakeholders (Bernhardt & Hébert, 2017). Thus, when teachers utilize data to inform their instructional practices they are not only serving students' varied and differentiated needs; but are also supporting the school improvement cycle by contributing to achievement data analysis.

1.4 Significance of the Study

Studies conducted within the Lebanese educational context pertaining to data-driven instruction is null to the knowledge of the researchers. Very few unpublished MA theses were detected in University libraries. However, those studies focused on the professional practical aspects of using data to create remedial programs (ex. Itani, 2018). All the studies the researchers got hold over were qualitative case studies employing very small samples; and were conducted within one school only.

Thus, this study attempted to investigate the notion of data-driven instruction quantitatively with a relatively large sample of schools so as to get a more representative insight about the status-quo of the investigated concept. It has focused on getting information as to whether teachers collected data, used-data to inform instruction, the professional development they received to analyze data; and their opinion as to the added value data analysis could bring to their own repertoire of teaching practices in their classrooms.

2. Method

2.1 Research Instrument

This study utilized a 20-items survey to derive necessary data. The survey was developed using the literature cited above which assures that the barriers for data-driven instruction often include

the lack of appropriate professional development and the beliefs held by teachers as to what data analysis can bring to their instructional practices. Besides, the survey attempted to explore whether teachers collected data in the first place and what they did with such data.
The survey was refereed by two education professors from one private university; who are prominent education researchers themselves. The survey was initially 15-items but with the feedback received from the referees, it was expanded to include more aspects to the researched topic.

The survey consisted of two parts. The first one requested participant teachers to provide demographic information about themselves. The second part provided statements for teacher to evaluate using a four-points Likert scale to rank their feedback about their experience with data-driven instruction.

2.2 The Sample

The sample comprised the population of all private teachers attending a conference at one private university in Beirut. Every single teacher entering the conference venue was handled a copy of the survey with a cover letter that describes the purpose of the study, assurance of anonymity and how data was going to be used. Both the cover letter and the survey were provided in one booklet in three languages (Arabic, English & French). Participant teachers were asked to complete the form with the language that they were mostly comfortable with.

The number of survey distributed at the door of the venue were 467; while the returned ones were 226. Out of the 226 only 213 were completed and hence constituted the sample of the study. While it was not an intended variable for the study, all participants' returned surveys were from either Beirut or Mount Lebanon. The conference was open to all teachers from across the country though.

2.3 Data Analysis

Data was analyzed using SPSS 21.0 for windows. Descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. Means scores, standard deviations and percentages were calculated per each item of the survey instruments.

3. Results & Discussion

3.1 Demographic Data

The sample involved in the study was almost equally distributed between males (48.7%) and females (51.3%). All teachers came from 2 governorates only (Beirut & Mount Lebanon). The majority of participant teachers were middle (36.7%) and secondary (35.2%) school teachers. Almost half (44.6%) of the teachers' ages range between 26-35 and novice teachers are no more than 5.4%. 78% of teachers possessed a bachelor's degree while 21.4% hold master's degrees and only 0.6% held PhDs. Finally, the 213 participant teachers came from 76 schools; 60.5% located in Beirut & the rest in Mount Lebanon. The demographic characteristics of participants are presented in table 1.

Table 1. Demographic Characteristics of Participants

Dimensions	%
Gender	
Male	48.7
Female	51.3
Governorate	
Beirut	65.6%
Mount Lebanon	34.4%
Bekaa	0.0%
North Lebanon	0.0%
Baalbeck/Hermel	0.0%
South Lebanon	0.0%
Nabatieh	0.0%
Akkar	0.0%
Age (Years)	
Less than 25	16.9
26-35	44.6
36-45	28.9
46 and above	10.6
Teaching Experience (Years)	
Less than 4	5.4
5-9	18.9
10- 14	25.1
15- 19	27.9
20 and above	22.7
Levels Taught (Grades Levels)	
Kindergarten	0.0%
Elementary	28.1%
Middle	36.7%
Secondary	35.2%
Highest Degree Held	
Bachelors (Graduated from faculties other than Education)	78.0
Masters	21.4
PhD	0.6
Participant Schools	
Beirut	46 (60.5%)
Mount Lebanon	30 (39.5%)

3.2 Descriptive Statistics

Section 2 of the survey instrument included 20 items which participant teachers evaluated using a 4-points Likert scale. Findings are presented in table 2.

Table 2. Frequencies, Percentages, Mean Scores and Standard Deviations of Teachers' Responses.

Items	*SA*	*A*	*D*	*SD*	*Mean*	*SD*
1. In our school we collect and document student assessment data.	196 92.0%	6 2.8%	5 2.3%	6 2.8%	3.84 96.1%	.789
2. In our school student assessment data is obtained from exams and quizzes only.	11 5.1%	188 88.2%	8 3.7%	6 2.8%	2.95 73.9%	.840
3. Student tests data is communicated to school stakeholders.	192 90.1%	4 1.8%	11 9.7%	6 5,3%	3.79 94.8%	.870
4. I use student assessment data to amend my lesson plans.	4 1.8%	11 5.1%	53 24.8%	145 68.0%	1.40 35.2%	.057
5. I use student assessment data to review the curriculum.	9 4.2%	6 2.8%	48 22.5%	150 70.4%	1.38 34.7%	.011
6. I use student assessment data to create remediation programs for my challenged students.	3 1.4%	6 2.8%	102 47.8%	102 47.8%	1.57 39.4%	.581
7. I use student assessment data to create data walls in my classroom for my students.	3 1.4%	6 2.8%	102 47.8%	102 47.8%	1.57 39.4%	.581
8. I invite students to self-analyze their personal assessment data.	16 7.5%	24 11.2%	28 13.1%	145 68.0%	1.58 39.5%	.847
9. In my school student assessment data is used to inform school improvement planning.	5 2.3%	6 2.8%	176 82.6%	26 12.2%	2.77 69.4%	.814
10. In my school student assessment data is used to inform teacher classroom observations.	21 9.8%	11 9.7%	175 82.1%	6 2.8%	3.04 76.0%	.939
11. In my school student assessment data is used to inform professional development planning.	5 2.3%	6 2.8%	76 35.6%	126 59.1%	1.48 37.0%	.814
12. I have received training in my school about usages of student assessment data.	17 7.9%	6 2.8%	117 54.9%	73 34.2%	1.84 46.1%	.919
13. I have received training about assessment for learning in my school (not assessment of learning).	7 3.2%	11 5.1%	30 14.0%	165 77.4%	1.34 33.5%	.763
14. I have all the 'know how' to amend teaching plans to accommodate data I collect from student assessments.	19 8.9%	14 6.5%	22 10.3%	158 74.1%	1.50 37.5%	.889
15. I have received training on analyzing data collaboratively with other teachers for our common student assessment results.	10 4.6%	9 4.2%	178 83.5%	16 7.5%	1.39 34.9%	.120
16. I believe I can teach better if I use student assessment data in planning my lessons.	16 7.5%	45 21.1%	128 60.0%	24 11.2%	2.24 56.2%	.847
17. I believe student assessment data is useful for deciding on student readiness for next lessons in my classroom.	31 14.5%	24 11.2%	26 12.2%	132 61.9%	1.30 32.5%	.574
18. I believe I am skilled enough to interpret student assessment data.	7 3.2%	11 5.1%	30 14.0%	165 77.4%	1.34 33.5%	.763
19. I believe that the systematic usage of student assessment data can be used to foster school improvement.	8 3.7%	6 2.8%	11 5.1%	188 88.2%	1.22 30.5%	.840
20. I think student assessment data constitute a learning opportunity for both me and my students.	19 8.9%	14 6.5%	22 10.3%	158 74.1%	1.50 37.5%	.889

3.2.1 Data Pertaining to Research Question 1: How do is data being used in schools?

Data collected to respond to this research question included items 1 through 11 in table 2. Results show that the majority of the sample of teachers collected and documented student assessment data (~95%). The origin of such data seems to be primarily exams and quizzes (93.3%). Such data is communicated with stakeholders (91.9%); meaning that students, parents, subject coordinators and administrators were all exposed to student assessment scores.

Despite being non-sporadic, respondent teachers reported that student assessment data was not being used to amend lesson plans (92.8%); nor to review the curriculum and enrich it (92.9%). Likewise, teachers did not use student assessment data to inform the development of remedial programs for their students (95.6%).

In the same vein, the majority of teachers who participated in the study did not seem to use data to create data walls to support students in creating goals and meeting them by self-monitoring their progress (94.8%). Not only this, only 18.7% of the participant teachers reported that they did invite their students to self-analyze their student assessment scores.

On a broader limit, student assessment data was not used to inform the provision of school improvement planning (94.8%); nor it apprised classroom observation planning by middle or senior leaders at school (84.9%). Similarly, data was not used by majority of schools to inform planning for continuous professional development (94.7%).

3.2.2 Research Question 2: To what degree are teachers professionally trained to embrace data-driven instruction?

Data collected to respond to this research question included items 12 through 15 in table 2. Results show that the majority of teachers did consider themselves to have received sufficient training in the area of analyzing and using student assessment scores (89.1%). Assessment for learning professional development seemed to be absent from teacher training, whereby only 8.3% of those teachers reported that they received training in this area.

Likewise, the majority of teachers who comprised the sample described themselves as not possessing the sufficient 'know-how' to use data to inform their instructions (84.4%); nor were they trained to collaborate with other teachers to understand their student assessment scores and make advantage of them (91%).

3.2.3 Research Question 3: What beliefs do teachers hold regarding the added value of data usage in the school?

Data collected to respond to this research question included items 16 through 20 in table 2. Results show that the majority of participant teachers did not embrace strong beliefs as to the implications of using data in their repertoire of teaching practice. In fact, 71.2% of teachers did not believe that analyzing student assessment data could help them teach better. They also underestimated the power of data in supporting them in detecting students' readiness for next lessons (74.1%). Besides, their self-efficacy pertaining to their ability at handling student data was relatively low (82.4%).

The majority of teachers involved in the study did not seem to believe that using data can leverage school improvement (93.3%). Finally, teachers did not believe that student assessment data when analyzed can constitute a learning opportunity for both the teacher and the student (84.4%).

3.3 Discussion

Unfortunately, the findings from this study provide a gloomy picture of the status-quo of the usage of student assessment data by a sample of middle and secondary private school teachers in Beirut and Mount Lebanon. While teachers collected and documented student assessment scores, little seemed to have been being made with those scores. This comes parallel to international findings (Ingram, Louis, & Schroeder, 2004; Earl & Katz, 2006; Schildkamp & Kuiper, 2010; Vanhoof & Schildkamp, 2014; Prenger & Schildkamp, 2018).

Classrooms lead by participant teachers do not seem to be data-driven. In fact, teachers do not seem to know what they could do with data apart from collecting it. They did not employ it to introduce changes to their instructional techniques, assessment procedures, curricular reviews, monitoring and evaluating student progress towards goals. In other words, schools seem to adopt 'assessment of learning' and not 'assessment for learning'. They are missing the unprecedented information that data (they already have) can offer (Yan & Cheng, 2015; Bowers, 2017).

Moreover, teacher participating in this study reported that they did not receive sufficient training that aided them in making use of data to adjust their instructional plans and approaches. According to many studies (ex. Demie, 2013; UNESCO, 2013; Bernhardt & Hébert, 2017; World Bank, 2018) it is essential for teachers to receive appropriate training to enable them to succeed at making advantage of data. Unfortunately, this does not seem to be the case with the researched schools.

Similar to instructional approaches, the schools as whole do not seem to be data-driven. Data is not being used to carryout informed decisions pertaining to continuous professional development, classroom observation protocols, and school wide improvement planning. If data is not used for informing such crucial decisions in the school, then it could be assumed that it is left to the gut feelings of the school leaders. This is quite a dangerous point as it entails that school move ahead without any evidence-based pronouncements. Bernhardt and Hébert (2017) underscore the huge benefits schools earn when they make advantage of data in school improvement planning; something that participant schools seem to be missing.

It can be argued that neither the classrooms, nor schools as a whole, seem to be data-driven or embrace a data-driven culture because of the beliefs its teachers held toward data and the added value it can potentially bring into the school. Teacher beliefs according to Prenger and Schildkamp (2018) should not be underestimated when examining the efficiency with which they utilized data. Teachers did not believe that data usage is an added value for them in offering better learning opportunities for their students. Not only this, teachers did not believe that data usage is of great importance for school improvement planning either. Add to this the fact that teachers' self-efficacy was relatively low as to how they valued their level of proficiency in dealing with data; then it is no wonder why teachers did not systematically analyze data and synthesize findings in the form of amendments to their repertoire of practice in their classrooms.

4. Conclusion

This study constitutes an alarming message to educationalists within the Lebanese school context. While data seems to be systematically collected and documented, neither instruction nor school improvement seem to be making advantage of such data. Teachers' self-efficacy pertaining to their abilities at handling and making use of data seem to be very low. This may be attributed to the lack or little professional development teachers received in this area.

Schools that do not use data are dangerous for its enrollees be that students or teachers. Data enables schools to make informed decisions at all levels from the very school improvement planning to the smallest aspect of supporting the progress of one of its students. In the absence of data usage schools would be giving a blind eye as to where they should be heading. In this scenario schools would be making decisions based on gut feeling, instinct, tradition, or theory.

Data-driven decisions are more objective and can be easily evaluated according to their impact on metrics. It has the potential to lead to greater transparency and accountability. In addition, this approach can improve teamwork and staff engagement because collaboration amongst teachers lies at its heart.

Building on the fact that differentiation of instruction is rooted in data usage; it can be argued that teachers involved in the study are not differentiating learning appropriately. It enables teachers to distinguish who needs enrichment and who needs remediation in his/her class. Ultimately, this helps all students get what they need to succeed.

5. Limitations and Implications

Findings of this study suggest that informed decision-making in schools and classrooms is absent. There is an urgent need for educationalists in Lebanon to focus on not only collecting data but rather on how it can inform instruction. Instruction is not driven by data but rather by gut feelings, theories, habits and traditions. Assessment for learning need to be in place the same way assessment of learning is in its place, as this study suggests.

While this study was limited to schools of Beirut and Mount Lebanon, it is integral to focus also on schools from the other 6 governorates of Lebanon to better capture the image of data usage in schools. It would be vital to carryout in depth qualitative studies post to surveying to gain deep empathetic understanding of the issue.

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