

District Strategic Teaming: Leadership for Systemic and Sustainable Reform

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Abstract	Article Info
<p><i>Reform efforts in schools have become increasingly focused on the nature and direction of teamwork in efforts to achieve sustained and systemic districtwide capacity for innovation and needed change. The six-year study reported in this article involved development, implementation, and assessment of a unique collaborative process for districtwide reform in some of the most challenging and fluid educational settings in the United States of America. This reform process, called District Strategic Teaming, involved a representative vertical cross-section of members from the district office to school-based support staff. Participating schools are located in isolated, rural communities in the south-eastern region of the United States of America that experience high rates of teacher turnover and serve student populations living in abject poverty. Despite these challenges, the longitudinal study revealed substantive improvement in organizational culture and reduction</i></p>	<p>Article History:</p> <p><i>Received</i> September 7, 2018 <i>Accepted</i> November 21, 2018</p> <p>Keywords: <i>District Strategic Teaming, Educational Reform and Innovation, Rural Schools</i></p>

of systemic barriers for innovation through the process described in this article.

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Introduction

Many school reform initiatives have less than stellar results, lack sustainable gains, and eventually fail as a result of ignoring the power of complex organizational realities within schools. The encouraging news is that school leaders, when provided appropriate evaluative data on their organizational capacity for sustained change, can powerfully influence and ameliorate these barriers, while simultaneously building capacity for future innovation (Alsbury, 2007; Killion, 2015; Wallace, 2002). Currently, revolving-door reforms, what Fullan (2001) called *projectitis*, are jading the promise of new educational initiatives, draining energy and desire from teachers to support and implement these programs in their classrooms, and destroying district focus. Localized successes in school reform often fail to sustain due to multiple and shifting organizational priorities (Coburn, 2003; Farrell & Coburn, 2017).

Reform efforts over the past decade indicated that strategic planning, increased accountability, and school restructuring in various forms often result in an absence of clear student achievement improvements. Some researchers believe this is primarily due to inadequate consideration of system analysis and planning (Coburn, Toure, & Yamashita, 2009; Mintzberg, 1993). Others point to (a) a need to add district-and state-level leadership to frequently unsustainable



building-level reform attempts (Coburn, Bae, & Turner, 2008; Fullan, 2005; Fullan, Hill, & Crevola, 2006), (b) more consideration for unique contextual variations in districts (Farrell & Coburn, 2017; Fullan, 2001), (c) inclusion of sustainability variables in reform plans (Coburn, 2003), and (d) use of distributed leadership (Elmore, 2000) and collaborative decision-making processes (Firestone, 1996) as reasons for failure. Further, Leithwood, Aitken, and Jantzi (2001) assert that "the consequences of tightening the accountability 'screws' often are a narrowing and trivializing of the school curriculum and the creation of work cultures that reduce rather than increase professional commitments" (p. 2). The local learning required for successful restructuring efforts must be aided by feedback about the consequences of innovative practices and information about remaining obstacles to change. An analysis of the system's unique culture during, and subsequent to, innovation or reform seems necessary if sustained change to a school's culture and a continuance of the resulting student achievement gains are to remain a viable goal (Deal & Peterson, 1999; Fullan, 2001; Hallinger, & Leithwood, 1998).

Strategic Teaming Model

In response to the need for a model to measure and track changes in organizational barriers and to support the development of organizational systems, Alsbury (2008) created interview, observational, and survey tools. These tools incorporated a merging and modification of organizational learning theory and survey tools developed by Leithwood and colleagues (2001) and sustainability theory and components described by Coburn (2003). The tools were then tested as an additional organizational systems component of an already established National Science Foundation (NSF) four-year

longitudinal study implementing the Science Writing Heuristic (SWH) initiative (Hand, 2008).

The study was conducted in a mid-western community with a population of 14,500 and a school enrollment of 2,300. This rural community relied on agriculture and light industry as its economic base and was mostly comprised of middle class, blue-collar workers. The school district included a middle school (Grades 7-8), a high school (Grades 9-12) and five elementary schools (Grades K-6). The SWH program, introduced in 2002, involved all three middle school teachers and all five high school science teachers. The outcomes of the Hand (2008) study included (a) validation of the Organizational Assessment Survey (OAS), (b) increase in organizational capacity to implement and sustain innovation, (c) improvement of student achievement, and (d) conclusions for need to couple organizational systems support to any innovative program implementation. As noted, this 2002-2006 pilot study provided validation of the OAS, which revealed significant student achievement improvements, especially among traditionally low-achieving students with special needs, and measured increased sustainability of the SWH innovation.

The findings indicate the OAS analysis and ensuing recommendations for system changes led to increased organizational capacity for implementing and sustaining Science, Technology, Engineering, and Mathematics (STEM) initiatives in the district into the future. The study also gave hints concerning missing elements in the process; namely the need for a collaborative, cross-district leadership team. This District Strategic Team (DST) was trained to recognize organizational sustainability variables discovered in the pilot study and tasked with (a) managing the implementation of the organizational systems survey; (b) analyzing and interpreting data



within the context of the district culture; and (c) providing recommendations for the elimination of organizational barriers at the central office, building, and classroom levels. During the pilot study, these functions had been led by the university research team, but it was determined they would need to be continued by the district once the grant reached completion. In 2007, the need for a Strategic Leadership Team to administer the Alsbury OAS and organizational systems process was fulfilled with the development

Innovation Leaders Academy

The previously described OAS tools were coupled with the development of a new Innovation Leaders Academy (ILA) team and piloted during a long-term longitudinal study (2007-2011) with six under-achieving rural school districts serving high poverty and high minority student populations in a southeastern region of the United States of America. The ILA process involves selection of a district-level ILA Team. The team members are selected in conjunction with the school-district superintendent, but must include the superintendent, assistant superintendents or central office directors, school principals, teacher leaders, and relevant support staff. The recommended size of the ILA Team is approximately 10 members, which has been shown to be a workable size to ensure full collaborative decision making. Additionally, the composition should include district- and school-level personnel who are participating in the reform initiative being implemented. For example, if the district were coupling the ILA process with the implementation of a STEM initiative at the middle-school level, the ILA Team would likely be composed of the superintendent, director of curriculum, director of technology, middle school principals, and balanced selection of middle-school STEM teachers and school-level technology support staff members.

The ILA Team's purpose is to identify and eliminate organizational barriers and to develop and support positive organizational characteristics and processes that promote improved implementation and sustainability of innovative programs in the school district. In other words, an ILA Team's charge is to ensure system-wide organizational support and sustainability for the innovation through

1. *Describing and contextualizing the issue or problem that needs remediation in their district.*
2. *Delineating potential organizational barriers and supports at classroom, school, and district levels that likely influence success of implementation and sustainability.*
3. *Administering the ILA organizational systems assessment tools to measure existing variables that support or present barriers to the implementation and sustainability of the innovation.*
4. *Using the ILA disciplined inquiry processes to guide the team's approach, goal setting, program and procedure implementation, and assessment. The product outcome is to develop and draft an Innovation Program Support Plan (IPSP) that provides action items to address and ameliorate barriers to program implementation and sustainability.*
5. *Analyzing ILA organizational systems assessment tool data to evaluate and revise the Innovation Program Support Plan, and to craft recommendations for changes to the organizational system in the district.*

To prepare an ILA Team able to achieve these activities, the research team (a) provides normative leadership training in six areas i.e., building capacity for innovation, collaborative decision-making, change processes, distributed leadership, adaptive leadership,



sustainability); (b) observes and coaches the ILA Team in teamwork processes; (c) facilitates collection of relevant contextual data within the district; (d) facilitates collection of organizational data on leadership, structural, cultural, and other identified constructs; (e) facilitates collection of baseline data and subsequent annual data; and (f) provides coaching to assist the ILA Team in making recommendations on contextual changes needed to realize sustainable success for their chosen program. The scale-up study of the ILA in the southeastern state provided revisions to and further validation of the ILA OAS tool and provided evidence as to the effectiveness of the novel Innovation Leaders Academy training and the ILA Strategic District Team.

STEM Career Awareness Project: Phase I

The development of the ILA Model began in 2011 with inclusion of the ILA processes into an STEM-education study was supported by a federal grant. The overall goal of the project was to connect six isolated middle schools in a rural southeastern state to the technology-rich resources and professional development opportunities at research universities in an urban center of the state. A project goal was to provide effective teaching in STEM disciplines to students in the participating middle schools and help them develop a better understanding of the potential of STEM careers.

The vision for the STEM Strategic Teaming strategy is accomplished using three component teams: (a) the School Teacher Team, (b) the School Student Team, and (c) the ILA District Leadership Team. The School Teacher Team provides traditional teacher training, curriculum resources, and technical assistance and equipment to create enriching experiences for the middle-school students. Specifically, students are exposed to a variety of experiences about STEM careers

(e.g. videos, guest speakers, information sheets) to enrich their understanding of STEM concepts and motivate them to pursue a STEM career. The School Student Team works outside the school with all students and parent participants to provide social and community support. Team activities include home visits; individual student follow-up to support positive school attendance, behavior, and academic success; and field trips to STEM competitions and sponsoring university activities. The ILA District Leadership Team members are trained and coached at a tri-annual academy to assess, track, and revise organizational systems that have often been found to complicate program implementation and sustainability.

One significant difference in the 2011-2014 study design was inclusion of a modified control group. All five school districts received the STEM Career Awareness curricular materials, fiscal resources, technology equipment, and teacher training on how to implement the program into their classrooms. The control group was not asked to form an ILA Team did not receive the ILA Support Team training. These modifications provided an opportunity to determine the effects of the ILA components on the implementation of the innovation.

The study findings emerged from analyses of pre- and post-administration of the OAS survey. These indicated that experimental districts improved their organizational capacity to sustain innovation through the use of the Strategic Teaming process while the control district declined in their support of the STEM initiative over the three-year study period.

STEM Career Awareness Project: Phase II

While findings from the first phase of the STEM Career Awareness projects were promising, some severe limitations to the OAS survey data occurred including (a) high turnover rates of the Strategic Teams



and school personnel over the course of data collection and (b) extremely low and fluctuating return rates for the pre- and post-surveys from some participant schools. Feedback from the District Strategic Teams indicated a number of concerns regarding the OAS survey: (a) questions in the survey that seemed too similar to respondents, (b) too many questions measuring the same organizational construct, (c) questions phrased in the negative that were confusing to some respondents, (d) questions regarding the STEM Career Clubs that were unknown to respondents who did not participate directly in the clubs, and (e) the survey included too many questions. These survey-design concerns led to revision of the OAS survey into a shorter instrument with (a) fewer questions, (b) a consistent number of questions linked to each organizational variable being measured, and (c) rewording all questions to be phrased positively. Results from optimal loading of questions using an exploratory factor analysis to determine internal instrument validity analysis provided a 35-item OAS survey that met internal validity criteria.

This new survey was used for program evaluation by the District Strategic Teams of four districts, some of whom were different from those in the Phase I study. These data were used to detect areas of strength and weakness in the organizational capacity to sustain the after-school STEM Career Club. This article describes the findings of the shortened 35-item OAS survey to assess the success of the after-school STEM Career Club reform initiative from Fall 2017 to Spring 2017. Although the initiative was in effect from 2014-2017, the returns of the surveys due to high turnover within the study schools made analysis of data in 2014-2015 invalid. Findings from the 2016-2017 academic year were sufficient to allow for data analysis.

These ILA studies moved the original idea of the importance of system-wide effects on program implementation from a survey to measure organizational variables to a more complete ILA district reform process. As the ILA process continued through the final stages of development, a new theoretical construct arose that successfully characterized the frameworks of the emerging ILA Model. This construct, *translational leadership*, was derived from a medical approach known as translational medicine and applied for the first time in an educational context when describing the ILA (Alsbury, Militello, Fusarelli, Overstreet, & Jackson, 2009; Fusarelli, Militello, Alsbury, Price, & Warren, 2010).

Translational Leadership

Translational leadership is a theoretical construct developed by Alsbury and colleagues (2009) and analogous to a rapidly growing approach for the translation of medical research to patient application, known as translational medicine (Cohrs et al., 2014). Translational medicine is a branch of medical research that attempts to more directly connect basic research to patient care. Translational medicine typically refers to the application of basic research into therapies for real patients. The emphasis is on the linkage between the laboratory and the patient's bedside, without a real disconnect, which is often called the *bench-to-bedside* definition (Woolf, 2008). Translational medicine can also refer to the development and application of new technologies in a patient-driven environment where the emphasis is on early patient testing and evaluation. In modern healthcare, a move to a more open, patient-driven research process is evident, which embraces a more research-driven clinical practice of medicine (Cohrs et al., 2014).

Translational leadership is similar to translational medicine because it focuses on custom-designed research based on contextual



realities of organizational variation, particularly in school districts attempting to implement and sustain innovation aimed at improving student achievement (Fusarelli et al., 2010). Translational leadership focuses on early testing and evaluation of student learning, thus providing a more open, client-driven research process and a linkage between the research design and implementation and the student's needs without a real disconnect (Woolf, 2008).

While translational leadership emerged as a potentially useful construct to describe processes like the ILA, its use is descriptive only. The actual definition of cogent characteristics and variables within a school district that support improved innovation implementation and sustainability, and thus the content of the ILA assessment tools emanate from a series of foundational theories and studies in educational leadership.

Theoretical Foundations for ILA

The recent drive for standards-based reform has been accompanied by a rapid and unprecedented focus on leadership development at the center of system renewal and change. The research evidence shows that effective leaders exert a powerful influence on the success of the school and the achievement of students (Wallace, 2002). The ILA model of Strategic Teaming applies theoretical components in disciplined inquiry, distributive leadership, organizational systems learning, and sustainability.

Disciplined Inquiry

The ILA process utilizes the definition of disciplined inquiry forwarded by Cronbach and Suppes (1969) that suggests it has “a texture that displays the raw materials entering into the argument and the logical processes by which they were compressed and rearranged to make the conclusion credible” (p. 15). Within the context of the ILA,

the hope for sustainable capacity building for innovation in districts that are unique and ever-changing requires that any reform process include on-going collection of data about the context of the system, analysis and public confirmation of the collected data by the participants, and transformative action in response to that data. The ILA is purported to be such a process, and thus, the evaluation of the process constitutes an empirical analysis of the cogency of discipline inquiry as a foundational component of reform process frameworks.

Distributed Team Leadership

Increased attention is being paid to the manner in which leadership can be conceived of as being *distributed* across the social and structural context within a school organization (Firestone, 1996; Smylie, Conley, & Marks, 2002; Spillane, Halverson, & Diamond, 2001). Leadership is no longer considered a role attached to one specific individual within the organizational hierarchy but rather distributed across a number of individuals within the organization (Firestone, 1996). This means that in the assessment of the quality or effectiveness of leadership in schools, not only the hierarchical leader but also the organization as a whole should be considered (Ogawa & Bossert, 1995). The most recent literature on change and school improvement also suggests that the form of leadership most often associated with improved learning outcomes is one that is distributed or shared (Fullan, 2001; Hopkins, 2001). Similarly, the literature on teacher leadership (Harris, & Muijs, 2004; Muijs & Harris, 2003) reinforces the potential of distributed or diffuse forms of leadership to generate improvements in teaching and learning.

Organizational Systems Learning

For the past three decades, school reform changes have lacked sustainability due to narrow focus on change in instructional



methodology and classroom practice rather than organizational structures and culture that provide the support systems critical to their survival (Coburn, Russell, Kaufman, & Stein, 2012; Sarason, 1990). The consideration of district organizational systems and processes, also called *systems thinking* by Senge (1990), is still rare in most organizations. Leithwood and colleagues (2001) developed a process for measuring school organizational structures and processes that support effective implementation of innovative programs directed at improving student achievement.

Sustainability

Researchers indicate that localized successes in school innovation often fail to sustain over an extended period of time (Coburn, 2003; Fullan, 2006; Guhn, 2009) and that even successful innovation efforts, resulting in significant student achievement gains over a short timeframe, often diminish or disappear after a few years even though the innovation appears to still be in place. Coburn (2003) indicated that sustainability can be attained by focusing on a principle called *scale*, necessary if reformers hope to maintain initial student achievement gains over time, with normal external forces such as social and political changes, and administrative turnover at work. The lack of studies that measure whether or not school districts incorporate the organizational components needed to sustain innovation over time is essential (Coburn, 2003).

Recently, researchers have begun to suggest that most educational reform efforts lack sustained change in a multilevel system. For example, Coburn (2003) and Farrell and Coburn (2017) indicated that localized successes in school reform often fail to sustain due to multiple and shifting organizational priorities. Thus, reform efforts likely fail both when exported to outside schools and districts or within

single school systems unless implementers of school improvement programs consider a principle she characterized as reform "scale" (Coburn, 2003, p. 3).

Scale is comprised of four main components: depth, sustainability, spread, and shift. All components of scale are necessary if reformers hope to maintain the initial student achievement gains over time, social and political changes, and administrative turnover. *Depth* involves a change in "teacher beliefs"(Coburn, 2003, p. 4), their underlying assumptions of how students learn, and involves a change in the "norms of social interaction" (p. 5) between the teacher and the student in the classroom. Further, "deep change" requires a change in the "underlying pedagogical principles" in the "enacted curriculum"(Cohen & Ball, 1999, p. 5).

According to Coburn (2003), lack of studies that measure whether changes, once implemented, are actually able to *sustain* over time is problematic. She notes that most studies do not continue to gather data at a school over multiple years (e.g., 4 to 6), nor after the funding and excitement of the new program has ceased. However, Coburn and Meyer (1998) and McLaughlin and Mitra (2001) have indicated that the greater the depth of change, the more likely reform will be sustained—even in the face of reduced resources and increase of competing new programs and initiatives.

Additionally, Coburn (2003) suggests that *spread* is not restricted to exporting a program to another school but rather also in finding a way to export issues of value, culture, and pedagogical principles at the study site to elsewhere. The district itself can affect spread by developing a common set of values and principles within all of its schools and leadership practices. This shifts leadership of reform to the district level and provides greater engagement by district personnel



than simply providing resources to buildings, which Coburn "spread within" (p. 7).

Finally, the idea of *shift*, described as the moment a reform effort is internalized or controlled and continued by actions of the district itself. Coburn (2003) suggests that the outside reformer may help with shift by training the district in what will be needed over time and how to go about sustaining the change. The concept of shift is different than simply change adoption; rather, it goes to the heart of systematic mechanisms that sustain change within district or school structures. These mechanisms include (a) assuring leaders at all levels of the district and teachers understand the pedagogy and nature of the reform, (b) providing a mechanism for ongoing staff development, (c) assuring continued funding of the reform, (d) holding the district formally responsible for continued dissemination of the reform through various practices (e.g., policy development, hiring practices, budgeting, scheduling time for change activities, implementing procedures within buildings), and (e) disseminating reform-centered ideas and methods through school or district decision-making that involves the staff and key leaders involved in the reform.

Organizational Assessment Survey: Phase II

The OAS uniquely integrates proven organizational variables from pre-existing, validated assessment instruments that build upon the work of organizational, leadership, and reform theorists, for more successful implementation and sustainability of innovative reform in districts (Alsbury, 2008; Coburn, 2003; Leithwood et al., 2001; Wallace, 2002). A significant portion of the survey questions were developed from interview questions used and validated on a smaller scale by Alsbury (2008) in the NSF-funded Science Writing Heuristic Project

(Hand, 2008), and identified disconnections that jeopardized the scale-up and sustainability of the program.

Applying Senge's (1990) systems theory of organizational learning, Leithwood and colleagues (2001) outlined a series of effective conditions found in districts and schools that successfully implement reform initiatives. Fullan (2005) supports the notion that "systems thinking in action" (p. x) is needed to successfully implement reform. As such, successful reform initiatives require school leaders to anticipate and accommodate for a shift in culture, the introduction of new paradigms, and the natural resistance that will likely occur when new initiatives are introduced. As a result, organizational sustainability must be addressed at the outset of reform initiatives. This can be provided through a rigorous monitoring system that identifies organizational barriers and provides appropriate interventions to guide necessary system realignment.

The substantive content of the OAS included a series of modified variables developed from previously discussed theoretical frameworks and former research findings that were modified as required from the loading results of the internal instrument validity assessment. The ensuing categories for the survey included (a) accountability, (b) effective leadership, (c) systems thinking, (c) learning organization, (d) data-informed decisions, (e) staff development, (f) parent involvement, (g) vision and planning, (h) innovation and change, (i) teacher awareness of the program, (j) school supports and barriers, (k) teacher overall professional satisfaction, and (l) teacher involvement in the reform effort.

District Strategic Team Data Analysis Activity

During the first year of this three-year grant, the district-wide ILA teams in the four neighboring districts were formed and met at a



university research institute for three 1-day (fall, spring, summer) training institutes and participated in structured teamwork with a coach. In addition, during the academic year, the ILA OAS Surveys were administered, and ILA team members analyzed the data collectively and critiqued the surveys for relevance and improvement of face validity. Data from the ILA surveys were used by the ILA Team with leaders in each of the four districts, to revise their original Innovation Support Plan. ILA survey statements are evaluated by respondents on a 5-point Likert scale, ranging from *Strongly Agree* (5) to *Strongly Disagree* (1). Following are examples of statements to be rated: *Teachers will not have adequate support for the changes they are expected to make to accommodate this new reform; The staff and faculty regularly assess strengths and weaknesses to improve the STEM Career Clubs Program; and The STEM Career Clubs Program may positively impact students.* Subsequent data from the ILA surveys and from the ILA Team's tacit knowledge survey inform the ILA Team of the current success of program implementation and any potential barriers. More importantly, data indicates whether the district's capacity for sustained innovation and reform is increasing.

Study Methods

The south-eastern area of the United States where this study was conducted has long stretches of fallow cotton and tobacco fields and occasionally a stop sign at a perpendicular crossing of county roads. Short stretches of small-town commercial areas usually have a mixture of open and vacant stores and one small family restaurant, all representing economies resulting from loss of fishing, textiles, and furniture building industries over several decades. Unemployment rates in the rural region are among the highest in the nation. Table 1 shows the demographics of the middle schools in the study. Note that

the school districts have up to 100% student participation in the federal free and reduced-price lunch program and as high as a 33% turnover of middle school teachers annually.

Table 1

Middle School District Data for 2016-17

School District	Student Body Size (avg.)	Free& Reduced-Price Lunch*	AYP** Targets Met/Total	High School Graduation Rates (4 yr cohort)	Teacher Turnover Rate	Alternate or Emergency Certified Teachers
A	541	76.3%	77/80	84.3%	17%	16%
B	248	99.4%	29/37	76.2%	33%	42%
C	372	99.6%	59/69	81.9%	33%	24%
D	377	100.0%	44/47	79.3%	31%	43%

*Percent of students living in poverty; **Annual Yearly Progress (student learning performance)

Table 2 shows that districts are under-performing with percent of students at grade-level in mathematics as low as 21% and in science varied from 47.8% to 65.8% across the four districts. The juxtaposition of conditions in these rural districts' needs is sharp. These middle schools serve low-income families, about 90% of whom are minorities.



Table 2

Summative Test Scores of Districts (% at or above Grade Level) for 2016-17

District	Grade 6		Grade 7		Grade 8		
	Reading	Math	Reading	Math	Reading	Math	Science
A	46.0%	35.7%	39.3%	28.5%	38.8%	27.5%	65.8%
B	34.1%	32.8%	36.3%	21.0%	31.7%	16.2%	47.8%
C	44.0%	37.1%	44.5%	26.4%	37.3%	21.7%	58.5%
D	44.0%	34.0%	48.9%	15.0%	41.2%	11.2%	60.6%

Although capable, experienced teachers staff about 80% of the classrooms, the rest are staffed through alternative means because recruitment of state-certified teachers in core disciplines to these rural areas is a constant challenge for principals. Careers in the high technology industries located in the closest regional research park are about two hours away, not a part of the daily life of the students. Teachers desiring to update their content knowledge or skills do not have resources readily available (e.g., universities, industry, technology firms) than do teachers in higher income, urban centers of the state. The *STEM Career Awareness* project directly served, on average, 30 STEM Club teacher leaders, 12 leadership personnel, and 200 students in four middle schools located in four participating districts during all three academic years (2014-2017).

ILA OAS respondents include personnel within the middle schools involved in the study and from whom a District Strategic Team was established. This included the middle school principals, assistant principals, all teachers in every subject, and all relevant support staff (i.e. technology support personnel, media center specialists). The two-part OAS survey was administered in Fall 2016 and again in Spring 2017. One part of the survey covers questions about general organizational dispositions and STEM preform involvement including (a) level of *involvement* of teachers and staff in the development and implementation of the reform program, (b) level of teacher and staff *satisfaction* in their current school, (c) level of concern over the *supports* and *barriers* that negatively affect their ability to do their job, and (d) teacher and staff *awareness* of the purpose and value of the STEM reform initiative. The second part of the OAS survey covers nine specific organizational variables linked to effective organizations that have the capacity to sustain reform efforts: (a) accountability, (b) effective leadership, (c) systems thinking, (c) learning organization, (d) using data to make decisions, (e) staff development, (f) parent involvement, (g) vision and planning, and (h) innovation and change.

Respondent Demographics

Survey demographic questions determined that respondents in all four districts were similar in terms of gender (87% female, 13 % male), ethnicity (70% African American, 30% White), and career tenure (approximately 52% with 10 years or more full-time teaching experience, 33% at 3 to 9 years, 15% at 0 to 2 years). More importantly, the demographics of survey respondents were representative of the gender, ethnicity, and tenure percentages in all faculty and staff in the four schools where the survey was administered.



Survey Returns

Return rates for the surveys are shown in Table 3. These results are unfortunately typical among poor, rural districts like the ones in this study districts experiencing high turnover rates of staff and fluctuation in personnel. Indeed, fluctuating return rates were more prominent in districts with principal changes. The ILA District Strategic administrators had to be convinced to continue supporting a program that was started under their predecessor, which was not highly successful in three of the four districts (A, B and D).

Table 3

ILA OAS Survey Returns, 2016-2017

District	Fall 2016			Spring 2017		
	N*	Returns	% Return	N	Returns	% Return
A	63	22	34.9%	63	12	19.0%
B	32	26	81.3%	32	20	62.5%
C	20	20	100.0%	14	10	71.4%
D	40	35	87.5%	35	16	45.7%

* Total number of potential survey respondents

Table 3 shows that with the exception of District A for the Fall of 2016 and District D for the Spring 2017, return rates were quite high with the majority of participants providing responses. This seemed to indicate that survey participation among teachers and support staff in the ILA schools did not diminish despite changes in the school’s principal and membership on the District Strategic Team.

Teacher Tenure

Notable is the discrepancy between the career tenure of the teachers and their school tenure at current middle school. Table 4 displays the percentage of teachers in the study whose career tenure and school tenure were 0-3 years. Overall, very few teachers had career tenures that were three years or less, except for District A. Indeed, most teachers in the study were very experienced with 60-70% at a tenure of 10 years or more. However, tenure at their current middle school was quite low, ranging from 63% to 100% of teachers with a tenure of three years or less. This also indicates the high annual turnover rate of teachers in the study schools.

Table 4

Teacher Career Tenure versus Tenure at the Study School 2016-2017

District	Fall 2016	Spring 2017
% Teacher Tenure of 3 Years or Less		
	Career Tenure (0-3 Years)	School Tenure (0-3 Years)
A	35%	75%
B	8.3%	100%
C	10%	71.4%
D	6%	63%

However, teacher turnover is not predicted to be as problematic for reform sustainability in districts using the ILA process, unlike the influence of high teacher turnover in traditional reform processes. In fact, the ILA process is designed to be a continuous learning system that involves multiple internal stakeholders at all levels of the school



organization and is therefore tailor-made to absorb a higher level of teacher turnover without effecting the fidelity of the reform process.

Study Results

The primary purpose of the ILA process is to facilitate the creation of, training, and coaching of a District Strategic Team (DST) to collect data measuring organizational variables common in effective and sustainable school reform efforts. The secondary was to identify and measure organizational barriers that might create a problem for successful implementation and sustainability of a new innovative program. Given that purpose, if the ILA process is a success, it is assured that the OAS survey would measure differences in the teacher and administrator perceptions about real program implementation issues as well as changes in their own experiences within their organizational culture. In practice, if the ILA process is working, the organizational culture should support capacity for a school to implement and sustain reform, and the teachers and principals working in that school should recognize this change and alter their responses on the OAS survey.

ILA OAS Survey Results: Fall 2016

Organizational variables among the four middle schools were assessed using the 35-item OAS. Organizational variables measured via the OAS included accountability, effective leadership, systems thinking, learning organizations, data usage, staff development, parental involvement, vision and planning, innovation and change, awareness, supports and barriers, satisfaction, and involvement. The same OAS survey was administered during the Fall of 2016 and again during the Spring of 2017. The current study data resulted a coefficient alpha of .92 for the OAS during Fall of 2016 and a coefficient alpha of .93 for the OAS during the Spring of 2017.

Correlations and descriptive statistics for organizational variables measured during the Fall of 2016 show that *vision and planning* was correlated strongly to innovation and change ($r(93) = .65, p < .01$), *parental involvement* ($r(93) = .61, p < .01$), *program awareness* ($r(93) = .65, p < .01$), and three other organizational variables, making it the most strongly correlated variable in the study. Indeed, *vision and planning* failed to correlate with only one variable; *teacher satisfaction*. In addition, *accountability* was strongly correlated to all variables including *vision and planning* ($r(93) = .54, p < .01$). Furthermore, *program awareness* among the staff was strongly correlated to four organizational variables including *vision and planning* ($r(93) = .65, p < .01$), and *parental involvement* ($r(93) = .65, p < .01$). Conversely, there were no correlations between *teacher satisfaction* and four of the organizational variables, including *vision and planning* and *staff development*. Also, *staff development* did not correlate with three variables, most notably *teacher involvement* in the program. Finally, *learning organizations* did not correlate with either *systems thinking* or *using data* variables.

ILA OAS Survey Results: Spring 2017

Correlations and descriptive statistics for organizational variables measured during the Spring of 2017 show that *vision and planning* was correlated strongly to *innovation and change* ($r(93) = .76, p < .01$), *parental involvement* ($r(93) = .59, p < .01$), *program awareness* ($r(93) = .55, p < .01$), and three other organizational variables, making it the most strongly correlated variable in the study. In addition, *innovation and change* was strongly correlated to all variables including *vision and planning* ($r(93) = .76, p < .01$). Furthermore, *effective leadership* was strongly correlated to five organizational variables including *innovation and change* ($r(93) = .58, p < .01$), and *supports and barriers* ($r(93) = .58, p < .01$). Conversely,



there were no correlations between *teacher involvement* and three of the organizational variables, including *systems thinking* and *staff development*. Furthermore, *staff development* did not correlate with four variables most notably *teacher involvement* in the program, *teacher satisfaction*, and *supports and barriers*. Notably, *learning organization* did not correlate with *using data* variables; and *teacher program awareness* did not correlate with *accountability* or *using data*.

Discussion

A number of interesting and critical findings emerge when the results are compared between the Fall 2016 administration and Spring 2017 administration of the survey. In reviewing these results, it is important to note that the District Strategic Teams (DSTs) had been working together for about two years, receiving coaching support and training, collecting and analyzing their own organizational data, and developing and implementing their Support Plan (IPSP) purposed to improve organizational capacity and sustainability for the STEM reform. As such, the teams may reasonably be expected to change their views regarding the importance they ascribed to various organizational variables between Fall 2016 and Spring 2017.

In addition, it is notable that all the variables in the study correlated with nearly all the other variables. However, in a few cases the number of strongly significant correlations (r value greater or equal to .50) changed. In addition, some variables did not show correlation. These subtle differences are worth noting given supporting qualitative evidence that DSTs from the four schools in the study varied in their principal's attendance and the DST members' participation, and implementation fidelity.

Vision and Planning

Vision and planning remained the strongest correlation in both the Fall 2016 and Spring 2017 results on the OAS surveys. *Vision and planning* not only produced the highest number of correlations with other organizational variables (six and five respectively) but also resulted in some of the highest correlations ($r = .76$ and $r = .65$ respectively) in the study.

A critical change was the finding that *vision and planning* showed no significant correlation to *teacher satisfaction* in the Fall 2016 survey but was highly correlated in the Spring 2017 results. Qualitative data gathered during the 2016-2017 school year, including participant quotes and coach observation notes from the ILA DST collaboration and planning meetings, indicated that participant beliefs changed over time. This included the changing belief that *teacher satisfaction* with the reform program in their middle school was, in fact, linked to the *vision and planning* of the DST. Team members indicated they changed their belief as a result of

- *Data the DST collected and analyzed that showed teachers becoming more satisfied and supportive of the reform program over time.*
- *The DST's efforts providing awareness, information, and training to all of the school staff regarding the importance of the reform program.*
- *Changing conversations and staff participation over time as the DST implemented its' Support Plan.*

In essence, the ILA DST collaborations, planning, implementation activities, and analysis of the ensuing results from the OAS survey data convinced the members of the strategic team that their own leadership through *vision and planning* were even more important to organizational health and sustainability than they originally thought. *Vision and planning* is the variable with the highest effect size correlated



to improved organizational capacity for reform efforts in schools reported in research findings (Chaikoed, Sirisuthi, & Numnaphol, 2017; Leithwood et al., 2001; Lesseig, Nelson, Slavit, & Seidel, 2016; Tyler, 2015).

Innovation and Change

Innovation and change was an organizational variable that measured transformation between the Fall 2016 and Spring 2017 survey responses. In the Fall 2016 survey, *innovation and change* was correlated strongly to only three other variables and had a low correlation to the variable *effective leadership*. However, in the Spring 2017 survey, *innovation and change* correlated strongly with 7 of 13 variables including *effective leadership*. Qualitative data, including participant quotes and coach observation notes from the ILA DST collaboration and planning meetings, indicated that participants changed their belief in the effects of leadership on school-culture change and reform success. The DST members became more convinced that their collaborative work influenced school culture, particularly in the area of increased innovation and the ability to change.

Current organizational systems research supports this finding. For example, according to Fidan and Balci (2017), school administrators need to understand more definitively how organizational structures must be compatible with an ever-changing, often *complexifying* environments and how promoting innovation is necessary to create and manage organizational changes. In the study reported in this article, the ILA provided a reform process for administrators to solicit data from every level of the organization and thus gain greater understanding about the complexities of their school culture. Further, the use of the District Strategic Team provided a collaborative vehicle

to promote innovative solutions by a broad cadre of stakeholders who intimately understand the complexities of the school.

Further, Bridwell-Mitchell (2015) asserts that three mechanisms drive teacher agency by either changing or maintaining institutionalized instructional practices. She contends that effective reform mechanisms favor innovation versus socialization in peer collaborations, cohesion versus diversity in community interactions, and cognitive and normative divergence versus convergence in teachers' shared understandings, aims, and practices. The ILA process and the composition of the DST supported an increase in innovative collaborations, cohesion within interactions with the internal community, and normative convergence in shared practices. The ILA process, however, expands this finding to include collaborative reform planning among administrators, teachers, and support staff, rather than among teachers only.

Effective Leadership

Effective leadership as an organizational variable was not measured as a key element in the Fall 2016 survey administration. In fact, *effective leadership* strongly correlated to only one variable: *accountability* and measured only a low correlation to two variables including *innovation and change*. This finding mimics a general concern among grassroots reformists (e.g. Cusick, 2014; Erskine, 2014), specifically that teachers have been led to believe that the primary administrative function is to hold teachers to disruptive high-stakes accountability mandates while discouraging risky innovation in the classroom (Guilfoyle, 2006; Johnson, 2006). Indeed, this concern has been evidenced by state and federal entities that pressure school leaders to standardize teaching practices and assessments. Given, the recent history of educational reform being primarily driven through removal of human agency in



teaching practice and expansive high-stakes standardized testing, the results on the Fall 2016 survey were predictable.

However, the Spring 2017 results indicated that the ILA process changed teachers' view of leadership. Results included strong correlations between *effective leadership* and five organizational variables including *innovation and change* and no weak correlations. Qualitative evidence suggests that ILA participants changed their view about how leadership is enacted and about the roles of leaders. Indeed, the survey results are even more significant when considering that not only did the members of the DST change their views of leadership but so also did the majority of teachers in the middle schools. This change in culture is seen in non-STEM teachers as well as those directly participating in the STEM Career Club.

Research in this field support our study findings. Results from the Sebastian, Allensworth, and Huang (2016) study suggest that effective principals use teacher leadership to improve the school learning climate. Specifically, the researchers point to the need for principals to promote teacher influence in all aspects of school organizational processes and conclude that this approach improves student learning. It is notable that one of the primary goals of the DST Team at the ILA meetings is to analyze collected data on all aspects of the school organizational processes to identify and ameliorate barriers to reform.

Parental Involvement

One surprising finding that emerged was the change in the survey responses regarding the variable *parent involvement*. In the districts, where the study was conducted, a common point of discussion and consternation at the ILA meetings was the lack of support and involvement of parents in their communities. Often, in the beginning

stages of the ILA process, the DSTs would become hamstrung in devising innovation to improve student learning because of the belief that the absence of parent support was a primary contributor to poor student performance. Initially, some members of the DST did not believe teachers could do much to overcome the negative influences from their students' home situations.

This perspective was reflected by many teachers in the participating schools, as evidenced by results of the Fall 2016 survey that *parent involvement* was correlated to 8 of the 12 variables leading to effective school organizations. In other words, teachers believed that the level of parent involvement has more influence on school effectiveness than variables like *effective leadership*, *using data to improve teaching*, and *teacher support* of the STEM initiative, to name a few. By the Spring 2017 survey administration, *parental involvement* was correlated to a moderate degree to only 4 of 12 variables. Qualitative data support the change in attitude among the DST members. Specifically, DST members began to believe that their collaborative leadership efforts had a more significant influence on improving student learning regardless of the level of parental involvement.

These findings are supported by Park and Holloway (2017) who found that parental involvement focused on parents helping their own child was more strongly related to school-level achievement in low-SES schools than involvement defined by school-event participation. This is particularly applicable because the DST members complained mostly about parents "only coming to sports events" rather than attending parent conferences or volunteering in the classroom. The perception of the type of parent involvement that influences improved student performance was changed by the participation in the STEM



Career Club project and in efforts of the DSTs to analyze and innovate the most effective forms of parental involvement.

Professional Development

One of the more consistent negative findings in the OAS surveys was lack of correlation between the variable *staff development* and other organizational variables. This result appeared in both the Fall 2016 survey data with no strong correlations and three variables without correlation as well as the Spring 2017 survey data where *staff development* had a low or no correlation with four of the other variables. Indeed, *staff development* was the lowest rated variable among the 13 measured in the survey.

Accordingly, Whitworth and Chiu (2015) conveyed teachers' viewpoints that staff development was not largely effective in improving organizational culture, improving teacher performance, or increasing student performance. Their review of literature concluded that school district leaders are not just a contextual factor but rather an integral part of the process and should be integrated into and considered part of any professional development model in science education. They conclude that "involving school leaders in science education professional development efforts can support teacher change by helping teachers develop professional communities, connecting teachers with resources, and encouraging and supporting changes in practice" (p. 136). Similarly, Blanchard, Southerland, and Granger (2009) concluded that district-offered professional development often does not incorporate characteristics of effective professional development (e.g. sustained modeling, effective pedagogical strategies, teacher teams) and is typically delivered in the form of short in-service workshops with little or no follow-up.

The composition of the District Strategic Team implicitly requires that school principals participate as an active member of the DST, attending all ILA meetings and engaging fully in the data analysis and development of the Support Plan. This continual involvement by school leaders in the ILA process is a unique quality of our reform model and supports Whitworth and Chiu's (2015) findings. Indeed, ILA Teams whose principal failed to attend the meetings and participate fully produced the lowest positive findings in the survey results.

Qualitative Data

In addition to the Likert-scaled survey questions in the OAS survey, there was a single open-ended question that asked: *What do you believe is the actual purpose of the STEM Career Awareness program?* Samples of responses are given below and are typical of the overall responses from the districts involved in the project from the first year in 2011 to the culminating year in 2017. Below are three responses posted in the Spring 2011 administration of the survey:

I believe that the purpose of it is to make other districts know about the districts that are underachieving.

Just another bandwagon program

I don't know anything about this program.

These two responses were included in the Spring 2017 survey administration:

To educate/enlighten students' knowledge of STEM careers available in the real world. Some students may find an interest in STEM careers they had never known existed or didn't realize that they had a talent for. Some of our students continue to say that they may not choose a STEM related career, however, they enjoy the activities and sparks their interest.



To make students aware of some of the many career opportunities on offer in the STEM fields and then engage them in fun and interesting hands on activities so that they can consider the possibility that they might find these careers fun and interesting too.

Anecdotally, participants reported that the ILA process was unlike others they had experienced, noting that the process pressed teams to engage in genuine collaborative decision-making, utilize data to shape their strategic goals, and evaluate more effectively the success of their current plan of implementation. Components from the six leadership concepts were measured and analyzed including (a) increased capacity of district to encourage and support future innovation, (b) transformation of their district culture, (c) change in teacher pedagogy, and (d) improved sustainability of innovation, to name a few.

Respondents reported the discovery and remediation of faulty two-way communication, the absence or poor operation of feedback loops, and the coherence of the new program to existing programs and to other support facets of the organization (e.g., budget, personnel, training). The ILA teaming process was reported to significantly change the scope and content of action plans to recognize and capitalize on the interdependency of organizational systems. The use of disciplined inquiry provided ILA DSTs and coaches the data needed to develop customized training modules for each ILA team and caused the teams to view action plans as flexible, responsive guidelines.

The findings in this study support the fecundity of the use of the ILA process and the District Strategic Teaming model to improve organizational capacity for reform implementation and sustainability. In addition, the findings support the use of the ILA process and the DST model to improve organizational learning and school culture to

support student learning in rural, high-poverty schools with a majority of underrepresented student populations.

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