

CRITICAL CONSTRUCTS AS INDICATORS OF A SHIFTING PARADIGM IN EDUCATION: A CASE STUDY OF FOUR TECHNOLOGY-RICH SCHOOLS

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This study presents and assesses a methodology for determining school-level commitment to an education paradigm. The methodology uses the concepts of paradigm change, border pedagogy, and border crossing to frame commitment to a paradigm as indicated by stakeholder engagement with 5 constructs of practice. It was applied to 4 schools noted for innovative use of technology. Data about 4 levels of engagement with the constructs were gathered using multiple research methods. The methodology was shown to differentiate school engagement with the constructs, commitment to change, and commitment to a paradigm. It appears to have potential for guiding school-level change.

As doubts persist about the efficacy of education in America, pressure increases for schools to improve (Commission on the Skills of the American Workforce, 2007; Partnership for 21st Century Skills, 2002). Responding to this growing pressure, a school must face the challenge of integrating its requirements for change, often externally mandated, with processes that build school-level capacity for improvement. In order to meet this challenge, a school must (a) analyze its circumstances, (b) learn about itself in ways that inform its commitment to change, and (c) build a school-level schema that reflects commitment and support for making the desired changes (Bain,

2007). This study presented and assessed a methodology that a school could use to engage with and evaluate its commitment to change. The presentation includes an account of the methodology's conceptual framework, research model, and application within four schools.

Improving education in America remains an elusive goal (Berube, 1994; Peterson & Chubb, 2003; Vinovskis, 2003). Moreover, research about improvement efforts suggests that implementation and management are oftentimes problematic (Kirst & Meister, 1985; Pogrow, 1996; Weatherly & Lipsky, 1977), as noted in attempts to alter classroom practice, because the efforts generate high levels of instability and divisiveness (Cuban, 2003; Elmore, 1996). The present model discussed in this article addresses this challenge. Four concepts contribute to its framework. One concept is the theory of paradigm change Kuhn (1996) developed. Kuhn's theory provides a potential way for a school to understand the paradigm to which it is currently committed, including the aspects

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of the theory structure associated with that commitment. With it, a school can clarify its baseline practices at the onset of its change effort and clarify the extent to which the commitment to that change is articulated or expressed in the school's methods, practices, systems, and tools.

A second concept is Aronowitz and Giroux's (1991) "border pedagogy." This concept provides a metaphoric way for a school to go beyond Kuhn's theory by describing struggles at the outer edges of a paradigm as "conflicts across borders." A school can use this concept to investigate and comprehend the change it is undertaking and the effect that change may have on stakeholders. Conversely, stakeholders, thinking in border terms, can explain and understand the ways in which the paradigmatic struggle is playing out within their school.

A third grounding concept comes from the work of Romo and Chavez (2006) who postulated that changes in educational practice are measurable as "border crossings" made by the adherents who reject a paradigm. The last concept is organized in a contextualized quadrant map Romo and Roseman (2004) developed that visually represents educational practices at a school. A school can use the map to explore its trajectory from one set of practices to another set.

The above four concepts, when combined, form a potential framework-narrative through which stakeholder practices at a school describe a paradigm to which the school is committed. When stakeholders in a school improvement effort disengage from those practices and engage in the practices of another paradigm, then they have crossed the border from one paradigm to another. A critical mass of stakeholders crossing the same border can result in a paradigm shift at that particular school. The contextualized quadrant also helps to represent, interpret, and plot that shift. The purpose of the present study was to explore the implementation of the model with four schools.

Method

Research Questions

Five questions guided the development and assessment of the proposed methodology. Each question was part of a sequential line of reasoning that established what we believed would be a valid and reliable research design for assessing school-level commitment to change. The first question addressed whether the expressions of

constructs of practice could serve as differentiators of a school's commitment to change. This principle appraises whether stakeholders at a school act on their commitment to a construct of practice differently (e.g., whole group versus differentiated instruction) than do their counterparts at another school.

Schools committed to the same expression of a construct of practice, however, may not have the same depth of commitment to that practice. To explore this possibility, we asked in our second question whether a combination of four data gathering methods produced evidence of convergence and divergence in the level and type of engagement with the constructs of practice. The answer to this question could reveal whether a multi-method data-gathering approach established whether the commitment of a school is widespread practice or merely aspiration.

Our third question sought to determine if convergence and divergence in the level and type of engagement with the constructs as indicated by multi-methods of data gathering signify the commitment to change by a stakeholder group. If the practices of stakeholders indicate their commitment to change (Kuhn, 1996), then the answer to this question should indicate the paradigm to which the stakeholder is committed. If a stakeholder's practice matched the current expression of a practice's construct, then the stakeholder should be committed to the current paradigm. If, however, a stakeholder's practice matched a desired expression of a practice's construct, then the stakeholder should be committed to the desired paradigm.

Our fourth question attempted to determine if the combined commitments to change by all stakeholders were indicative of the paradigm to which a school is committed. According to Kuhn (1996), the cumulative practices of a paradigm's adherents reflect its theory structure. Hence, the answer to this question should reveal whether a school, by virtue of its stakeholders' practices, was committed to the current or desired paradigm.

Our fifth question examined if confirmation of a school's commitment to change contributed to an accurate assessment of its commitment to a paradigm. Type and level of change reflected one element of paradigm commitment. Deep and broad changes in practice indicated a change in paradigms. Therefore, confirmation that a school had realized its commitment to change should provide an apt assessment of a school's paradigm commitment.

As indicated above, ascertaining the extent of change in schools has often been problematic. In response to this problem, we sought to develop and assess a methodology for determining the depth and breadth of a school's engagement with change and to use the information from that assessment to determine a school's paradigm commitment. The answers to questions one through four above plausibly established the sequential design elements of the study. The answer to question five established the commitment to change, hence a paradigm, of a school. In sum, our methodology set up a way to view constructs of practice, delineate their expressions, ascertain whether engagement with the expressions was aspiration or practice, and visually represent a combination of those expressions as an indicator of paradigmatic commitment by a school. This article presents and assesses that methodology.

Case Selection

We investigated four schools that represented a cross-section of the contemporary American educational establishment. They included: (a) public and non-religious private education; (b) elementary, middle, and secondary grade levels; (c) charter, pilot, and conventional governance relationships; (d) diverse student populations; and (e) rural, urban, and suburban locations. Media, education, and research groups have recognized each school for its innovative use of technology. The sample for the study totaled 58 participants: 40 instructors, and 18 site leaders. Each sample group represented a random cross section of grade level, discipline, and function at their respective school and across schools.

Each school had a demonstrable record of educational accomplishment in the innovative use of technology as evidenced by attention from media, professional associations, professional publications, and recognition within their broader systems and communities (Huebner & Corbett, 2004). Each also (a) aspired for school-wide change, (b) committed significant resources to its change process, (c) included technology as an essential component of its change effort, and (d) committed itself to constructs of practice with potential for improving student learning. The constructs of practice were instruction, information access, presentation modality, performance feedback, and parent engagement. The schools intended to use the data generated by the study to establish

new baselines and determine next steps for their respective change processes.

School One is a private residential high school (grades 9-12) located in rural New England with 360 tuition-paying students in attendance. The student population is 13% Asian, 5% African American, 1% Hispanic, 83% Caucasian, and 40% of the students have learning disabilities. The school has 99 full-time staff, 41 non-instructional and 58 instructional. Its sample group had 15 participants, 10 instructors, and 5 site leaders. In 1993, the board of directors committed the school to a robust, learner-centered, research-based curriculum based upon a school design model (Bain, 1996) and a theory of self-organizing schools (Bain, 2007). The school was reportedly one of the first educational institutions in the nation to require students and staff to use laptop computers.

School Two is a pilot high school (grades 9-12) in a large urban school system located in the northeastern United States with 360 students in attendance. The student population is 6% Asian, 53% African American, 28% Hispanic, 13% Caucasian, and 85% of the students are eligible for free-and-reduced meals. The school has 37 full-time staff, 8 non-instructional and 29 instructional. Its sample group consisted of 16 participants, 11 instructors, and 5 site leaders. The school affords students a challenging technology-based, interdisciplinary curriculum.

School Three is part of the fourth largest county school system in a southeastern state. It opened as an elementary school in fall 2000, earning charter status in January 2005 with 722 students attending its pre-k through grade-five program. Student composition includes 64% non-English speaking language proficient, 21% Caucasian, 79% minority students, with 48% of the overall student population African American. The school has 78 full-time staff, 17 non-instructional and 61 instructional. Its sample group had 12 participants, 9 instructors, and 3 site leaders. The school's charter calls for using talented and gifted strategies with every child, using technology, and requiring involvement of all parents.

School Four is part of the sixth largest county school system in a southeastern state. It opened as middle school in August 2000. Approximately 1,660 students attend grades six through eight. Of its population, 50% the students are Caucasian, 39% African American, 5% Hispanic, 3% Asian, 3% interracial, and 32% of the overall student population receives free-and-reduced meals, 17%

participate in early intervention programs, and 12% are enrolled in special education programs. The school has 128 full-time staff, 31 non-instructional and 97 instructional. Its sample group consisted of 15 participants, 10 instructors, and 5 site leaders.

Case Study

Case study is a valuable qualitative research method in education (Merriam, 1998). It is useful for answering how or why research questions and interpreting uncontrollable events where the boundaries between phenomenon and context are unclear (Yin, 2002) and multiple sources of evidence exist (Stake, 1995). Case study might utilize documentary, survey, interview, and observational data-gathering techniques (Merriam, 1998). The documentary approach involves gathering and analyzing guides, instructional materials, reports, and other artifacts. Surveying consists of collecting and analyzing written responses to questions. Recording and analyzing verbal responses to questions asked in person characterizes interviewing. Observational approaches involve watching subjects in specific settings and recording their actions. Mixed-method approaches to case study might utilize a combination of these techniques (Creswell & Plano-Clark, 2007).

Each of the four schools investigated in this study had a system of assumptions, beliefs, interactions, practices, and traditions that reflected its respective commitment to an education paradigm. Each school had explicitly expressed its commitment to educational improvement through differentiated instruction, ubiquitous access to information, accommodation of learning modality preferences, feedback about performance, and engagement of parents. As such, applying the case study research methodology to the schools represented an opportunity for gaining a meaningful interpretation and deeper understanding of school-level change.

We sought to develop a methodology and potential to reconcile rationale planning with school realities and applied to our aforementioned questions. First, we thought about each of the five

constructs of practice to which the four schools had made commitments as a center point on a continuum with current and desired expressions of the constructs as its end-points. Next, we made the continuum operational and identified four types of stakeholder engagement: aspiring, reporting, understanding, and practicing. Each type of engagement represented a level of commitment to an expression of a construct of practice. To each engagement type, we assigned a data-gathering method (documentary, survey, interview, or observation). Our developed checklists aided in gathering the documentary data (e.g., curriculum guides, job descriptions, strategic plans). Surveys consisted of written questions designed to encourage stakeholders to report their engagement with a construct. We developed interview guides with questions and prompts designed to encourage stakeholders to demonstrate their understanding of engagement with a construct. For example, the interview prompt: "Tell me about the ways you engage parents . . ." was followed by the prompt: "Please describe the last conversation you had with a parent." We developed observation checklists to help us capture the incidents in which stakeholders were practicing with the construct expressions (e.g., differentiation of instruction). By combining the engagement types with the data gathering methods, we formed the Method and Engagement Category Field (Table 1).

Third, we developed three ways to present the evidence of engagement with the constructs of practice. First, we created an Engagement with Constructs Matrix by combining the two components described earlier (see Table 2). The matrix represents the intersection of the construct expressions, data-gathering methods, and engagement types. Each point of intersection forms a cell. For instance, the matrix has a cell that contains documentary evidence about aspiration to provide ubiquitous access to information. Singularly and collectively, the cells provided a deeper view of stakeholder engagement with the constructs. They made the clusters of data more apparent and loosened the boundaries between them.

TABLE 1: *Method and Engagement Category Field*

Documentary	Survey	Interview	Observation
Aspiring	Reporting	Understanding	Practicing

TABLE 2: *Engagement with Constructs Matrix*

		Data Gathering Method			
		Documentary	Survey	Interview	Observation
Engagement type		Aspiring	Reporting	Understanding	Practicing
Construct Expression	Differentiated instruction				
	Ubiquitous access to information				
	Accommodation learning-modality preference				
	Feedback about performance				
	Engagement of parents				

TABLE 3: *School Paradigm Commitment Rating*

	Sample Group	Section Rating	Commitment Rating
School One	Site leader sample 1	20-100	20-100
	Instructor sample 1	20-100	
School Two	Site leader sample 2	20-100	20-100
	Instructor sample 2	20-100	
School Three	Site leader sample 3	20-100	20-100
	Instructor sample 3	20-100	
School Four	Site leader sample 4	20-100	20-100
	Instructor sample 4	20-100	

Fourth, we created the School Paradigm Commitment Rating as a second means to present an aggregate view of stakeholder engagement with the construct expressions. Ratings quantified the levels and types of engagement with the constructs. The levels and types of engagement reflected commitment to change. A higher rating reflected a greater engagement, hence greater commitment to change. The ratings ranged from 20 through 100. Table 3 presents these ratings.

Last, we developed the Paradigm Pedagogy Map as shown in Figure 1 (see page 286). It consists of a contextualized quadrant for presenting evidence about the trajectory of change for

a school. The map visually represents a school's commitment to change. Each quadrant on the map represents a different level of commitment to change by a school as indicated by the engagement of its sample with the construct expressions. Quadrant 1, current paradigm, represents no commitment to change and no engagement with the desired construct expressions. Quadrant 2, idiosyncratic activity, represents a disparate commitment to change and chaotic engagement with the expressions. Quadrant 3, school of thought and practice, represents a pervasive commitment to change and orderly engagement with expressions. Quadrant 4, alternate-education paradigm,

represents a replicated commitment to change by samples at multiple schools. Quadrants 1 and 4 represent commitments to the current and desired paradigms respectively. Quadrants 2 and 3 represent steps in between.

Data Gathering

The lead author spent 373 hours gathering data and spent between 60 to 80 hours on site at each school. He applied each data-gathering method to every member of the stakeholder sample. Data gathering via the multi-method approach generated 317 documents, 58 completed surveys, 58 interview transcripts that totaled 871 pages, and 43 observational records. The response rate for the survey method was 100%. The continuation rate from the survey method through the interview and observation methods also was 100%. Based on the response rate and volume, the evidence reported is an accurate, replicable, and internally valid representation of the

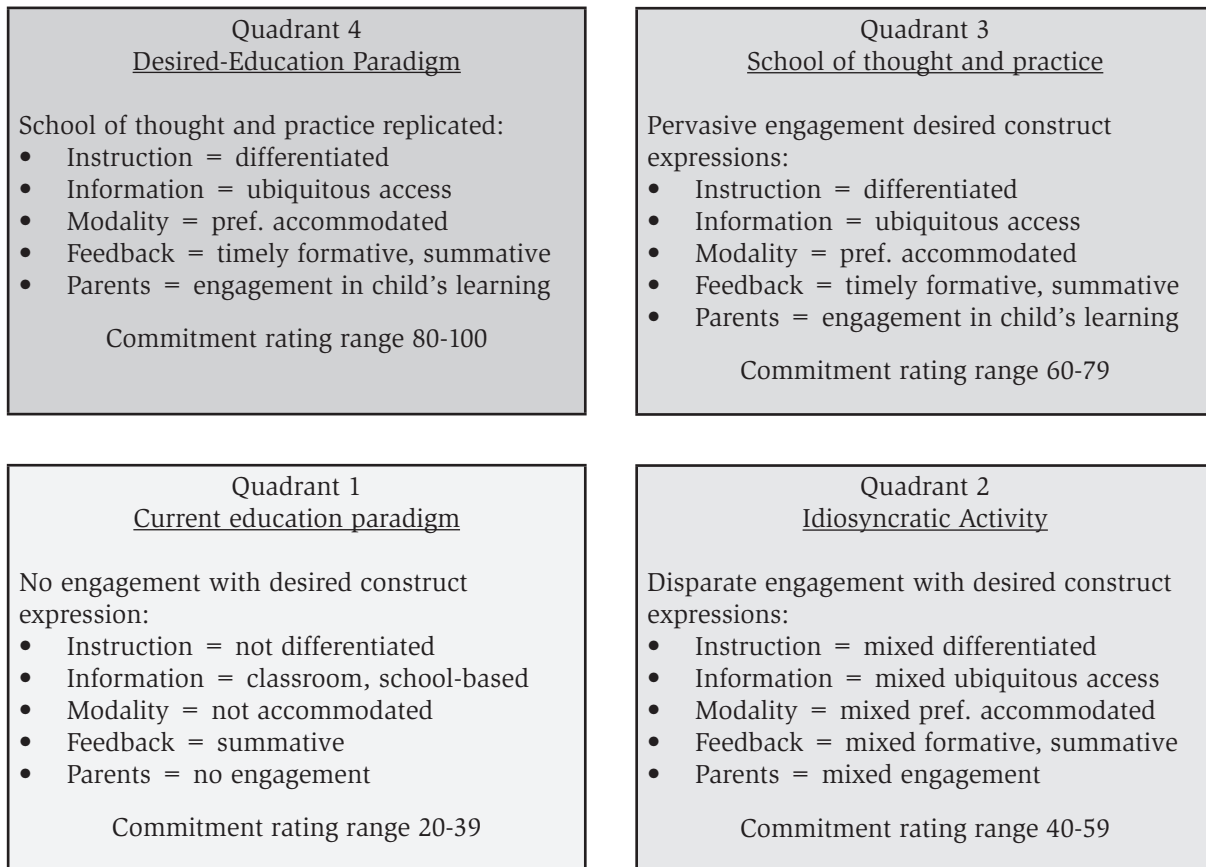
aspiring, reporting, understanding, and practicing of the sample and the schools from which it was drawn.

Data Analyses

We present the rated data on the Engagement with Construct Expression Rating Scale. The scale contains 160 cells, 40 sets, 8 sections, and 4 paradigm commitments. We used behaviorally anchored cell ratings that ranged from 1 through 5, with 1 representing minimal engagement, 2 representing disparate engagement, 3 representing idiosyncratic engagement, 4 representing pervasive engagement, and 5 representing replicated engagement.

A set is the sum of the cell evidence for one expression. Set ratings range from 4 through 20 with a rating of 4 through 7 representing minimal engagement, 8 through 11 representing disparate engagement, 12 through 15 representing idiosyncratic engagement, 16 through 19 representing

FIGURE 1: *Paradigm Pedagogy Map*



pervasive engagement, and a rating of 20 representing replicated engagement. A section is the sum of the set evidence for a sample. Section ratings range from 20 through 100, with a rating of 20 through 39 representing minimal engagement, 40 through 59 representing idiosyncratic engagement, 60 through 79 representing school of thought and practice engagement, and 80 through 100 representing replicated engagement.

A paradigm commitment rating is the average of the sections for the sample groups at a school. For example, the section ratings for the instructor and site-leader samples at School One were 66 and 68, respectively. Averaging these ratings produced a paradigm commitment rating of 67. Paradigm commitment ratings range from 20 through 100, with a rating of 20 through 39 representing minimal commitment, 40 through 59 representing idiosyncratic commitment, 60 through 79 representing a school of thought and practice commitment, and 80 through 100 representing replication.

As part of our analysis of the data, we manually reviewed the documents, interview transcripts, and observation checklists and tabulated the responses to the surveys. During our review of the documents, we flagged passages and categorized them according to the construct expressions to which they corresponded. The flagged passages, when combined, became a documentary thread that we used to ascertain aspiration for engagement with the construct expressions. Our tabulation and analysis of survey answers revealed patterns of reporting by the sample about their engagement with the construct expressions.

Likewise, we manually reviewed the interview transcripts. We flagged passages that pertained to the construct expressions and then combined those passages to form an interview thread that we analyzed to understand the type of engagement with each construct. From our manual review and synthesis of the observational data, we produced a summary of incidents. Analyzing the incidents helped us ascertain the sample's real-time practicing with the construct expressions. This way of processing the data made the evidence of engagement more apparent to us and contributed to a deeper understanding of a school's commitment to change.

Results

We investigated a multiple-method approach for assessing the commitment of four schools to change. The engagement of stakeholder samples from each school with the expressions of five

constructs of practice indicated change. A sampling of the data from two of the four schools gathered via the four methods is presented in Table 4 (see page 288). The data are identified via engagement with one construct expression, differentiated instruction. The data sample reflects the multiplicity, strength, and explicitness of engagement by the instructor group.

For School One, the data indicated engagement with the construct expressions that was (a) consistent across methods, (b) strong (e.g., 100% agreement about regularly customizing assessment), and (c) explicit (e.g., references to multi-level instruction). Conversely, the data for School Four indicated engagement that was (a) inconsistent across methods (e.g., aspiring to differentiate instruction, but limited reporting, understanding, and practicing of differentiation); (b) weak (e.g., 50% agreement about regularly customizing assessment); and (c) inexplicit. A summary of the evidence for the sample appears in Table 5 (see page 289). The summary shows that School One earned a paradigm commitment rating of 67 out of 100. The school achieved a solid practice commitment characterized by widespread engagement (aspiring, reporting, understanding, and practicing) with all construct expressions. Of the expressions, School One engaged more with differentiated instruction, ubiquitous access to information, and feedback about performance and less with engagement of parents in their children's learning. Its engagement with parents was consistently lower than its engagement with the other expressions.

School Two achieved a paradigm commitment rating of 45 out of 100. It showed an idiosyncratic commitment to change that is characterized by frequent but inconsistent engagement with all construct expressions. Of the expressions, the school had more engagement with parents, differentiated instruction, and ubiquitous access to information and less engagement with accommodating student learning-modality preference. Moreover, a difference existed between the site-leader and the instructor group set ratings for the differentiated instruction and accommodating student learning-modality preference expressions. This differential reinforces the idiosyncratic status that the school earned.

School Three achieved a paradigm commitment rating of 56 out of 100. Analysis of the evidence indicated that the school achieved a strong idiosyncratic commitment to change that was characterized by inconsistent, often-disjointed

TABLE 4: *Data Sampling - Schools One and Four*

		School One—Instructors	School Four—Instructors
Method	Engagement	Differentiated Instruction	Differentiated Instruction
Documentary	Aspiring	The English curriculum is outcomes-based and organized in four skill levels for reading, writing, and oral communications; mastery of all skills in the first three levels of each skill area is a graduation requirement . . . Multilevel instruction in each class allows students to progress and accelerate at their own rate, moving through units that require demonstrated mastery. (<i>Program of Studies</i>)	Special education teachers will plan differentiated learning activities with regular education teachers during Unit Planning meetings. (<i>Improvement Plan</i>)
Survey	Reporting	Do you regularly customize the assessment(s) of student's performance to reflect the ability of that student? N = 10; Yes = 10, No = 0	Do you regularly customize the assessment(s) of student's performance to reflect the ability of that student? N = 10; Yes = 5, No = 5
Interview	Understanding	One of the reasons that we have three groups in the same class is that there are many times when we do not need to level, and it is a good thing for the kids to work together . . . Almost every topic we break off into the multiple levels because we go into much greater depth. (Instructor B1)	I like to give my students across-the-board assignments. I give them the same exact thing and then from there I look at those who are struggling and figure out how I can help them. I want them to see where they should be. (Instructor B4)
Observe	Practicing	At 12:42 PM, teacher says to students, "I assigned levels. If you disagree, please see me after class. I put the following [writes names on board] in accelerated . . . the following in standard . . .	At 9:20 AM, instructor assigns students to groups of three, distributes worksheet, and says, "You have 20 minutes to solve the problems. Please provide answer and show your work." Note: instructor later confirms worksheet is same for all students.

engagement with all construct expressions. Of the expressions, the school engaged more with differentiated instruction, engagement of parents, and timely, formative, and summative assessment of performance and less with ubiquitous access to information. For the later, age of students may have been a moderating factor. The section rating for the instructor group was four points higher than it was for the site-leader group, suggesting unrealized potential commitment to change.

School Four achieved a paradigm commitment rating of 31 out of 100. This means it had a minimal commitment to change as characterized by widespread, consistent engagement with the current construct expressions. Of the expressions,

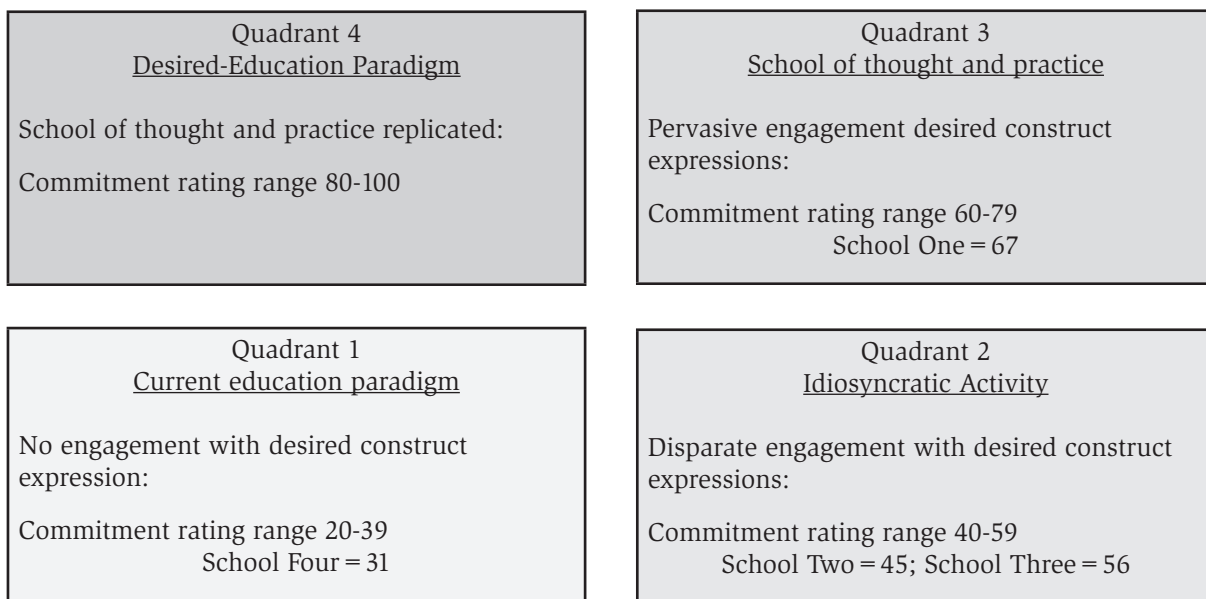
the school engaged more with differentiated instruction, accommodating student learning-modality preferences; they also had less ubiquitous access to information, timely formative and summative assessment of performance, and engagement of parents in their children's learning.

We plotted the schools on the Paradigm Pedagogy Map, using the paradigm commitment rating that each had earned. Map placement is a visual representation of a school's commitment to change. According to the ratings, School One was plotted in quadrant 3, Schools Two and Three in quadrant 2, and School Four in quadrant 1. Figure 2 shows the plotted schools.

TABLE 5: *Set, Section, and Paradigm Commitment Rating Summary*

		Instructor Sample School One	Site-leader Sample School One	Instructor Sample School Two	Site-leader Sample School Two	Instructor Sample School Three	Site-leader Sample School Three	Instructor Sample School Four	Site-leader Sample School Four
Expressions of Constructs of Practice	Differentiate instruction	16	16	7	11	14	14	8	6
	Ubiquitous access to information	16	16	10	10	6	8	5	5
	Accommodate modality preference	8	12	5	7	10	11	8	6
	Feedback about performance	16	16	9	9	13	10	6	5
	Engagement of parents	10	8	11	11	13	13	6	6
School section rating		66	68	42	48	56	56	33	29
School paradigm commitment rating		67		45		56		31	
		School One		School Two		School Three		School Four	

FIGURE 2: *Paradigm Pedagogy Map with Schools Plotted*



Discussion

As indicated in our review of the literature, assessing school-level change has been challenging. This study presented and assessed a school-level methodology for determining a school's commitment to change and the paradigm represented by that commitment. The five research questions that guided this study framed its findings about our methodology and its application to four schools.

First, the construct expressions appeared to be valid and reliable differentiators of schools. The data indicated rating differences, with lower ratings signifying less engagement, across schools for the engagement of the stakeholders with the expressions. For instance, the instructor sample from School Three had a rating of 13 out of 20, indicating more engagement with parents than that of comparable samples from Schools One and Four with respective ratings of 10 and 6. Moreover, the respective parent engagement ratings for the instructor and site leader samples at Schools Two, Three, and Four were identical, indicating within school consistency. Findings of this type suggest that the methodology has the capacity to indicate whether the commitment to change differs within and across schools.

Second, the multiple-method design appeared to produce reliable and valid evidence of convergence and divergence among the depth of engagement with change within and across schools. For instance, though the data indicated a similarity in the schools' aspirations, only School One consistently realized its aspiration in practice. The aspiration of the other schools dissipated to various degrees, as we were able to tease out their reporting, understanding, and practicing types of engagements.

Third, the design produced convergence and divergence of level and type of engagement—higher rating suggests greater engagement—across and within schools. For instance, the data indicated that the set ratings for the instructor samples' engagement with the differentiated instruction construct expression ranged from 7 to 16 out of 20. Moreover, the set ratings for the same samples ranged from 5 to 16 out of 20 across all constructs. That the methodology generated these ranges suggested it has the capacity to show differences among engagement with change across schools.

Fourth, the cumulative practices of stakeholders, according to Kuhn (1996), are indicative of a theory structure and paradigm. The differential

between the section ratings for all the instructor and site leader samples at the schools ranged from 2 to 5. This low differential means that the engagement with change by the site-leader and instructor groups was consistent and reflective of the paradigm commitment of their respective schools.

Fifth, since type and level of engagement with change indicates commitment to a paradigm, the cumulative evidence of the sample groups yielded an apt assessment of the schools' commitments to change. The findings show one school possessing a commitment to change characterized as a school of thought and practice, two schools with idiosyncratic commitments to change, and one school with a minimal commitment to change.

Of the findings, the first four indicate that our methodology has credence. The fifth finding, a result of applying the methodology to four schools, suggests the commitment to change and a paradigm of each school. When viewed in total, these findings indicate that our methodology stands in contrast to the difficulties associated with assessing school-level change discussed in the literature review. The findings also suggest that our methodology has potential for serving as a trajectory of change—where none currently exists—that may be of value to a school.

Limitations & Future Research

The study has several inherent limitations, most notably internal and external threats to extended inference and objectivity. The source of these threats includes the study's focus on just four schools, their unmatched nature, and the scope of the participant sample. As such, comparisons and extended inference about the sources of difference across them and the generalization of the findings to a broader range of schools are problematic. The study involved no analysis of the quantitative data to establish parametric statistical differences and the probabilistic likelihood of the findings. Moreover, the survey instruments were not validated from a normative assessment perspective. As such, the reference to variance in the results section means similarities and differences in the descriptive data rather than a parametric analysis.

Realizing the potential of the model presented herein comes from the interrogation of those views and perspectives represented by the descriptive statistical data in order to establish a deeper understanding of the school's engagement with change. As such, the descriptive data

points represent summative placeholders for the detailed views and perspectives that underpin them. While the quantitative data made it possible for stakeholders to locate their schools within the paradigm map and to use the terminology associated with the conceptual framework, features they deemed highly informative and useful, it is the specific continuities and discontinuities represented by the numerical data that are most informative to the change processes with which the schools engaged.

Applying the model to other schools could potentially contribute to a better understanding of the effective protocol and the nature of school-level change. If applied to other schools, focus might be given to the (a) variables prompting stakeholders to cross borders; (b) impact, if any, crossings have on stakeholders left behind; (c) variables encountered by the stakeholders crossing borders; (d) experience of arriving in a new quadrant; (e) activities engaged in after arrival; and (f) relationship of their migration to the emergence of an alternate-education paradigm. Moreover, since the study revealed that one of the schools resided in quadrant three, then finding other schools whose patterns of engagement with change, theory structure, and practices are similar to that school could indicate a pattern of widespread change. These schools might prove to be a cohort for understanding the migration from quadrant three to quadrant four.

The findings of this study give credence to expanding the investigation of the methodology presented here to additional schools. The prospect that pressure for schools to change will lessen soon is unlikely. In that pressure-laden context, the problematic nature of school-level change represents both motivation and opportunities for such expansion. Future research should include an examination of those factors (e.g., schema building) that contribute to successful and sustainable engagement with change. Attention should also be given to the possibility that the pressure for schools to improve reflects a more pervasive, perhaps paradigmatic, change that is underway within American education.

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