Investigation of the Learning Environment in Higher and Lower Performing *Education for a New Era* Schools

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Abstract

Recently, Qatar established key elements of educational reform including curriculum standards; emphasis on student-centered teaching; charter school establishment; standards-based assessment; English as the language of instruction, and extensive teacher professional development. While study of organizational structures/outcomes of this reform is ongoing (Rand, 2007), little attention has been placed on the study of classroom processes. Since the reform focuses on learning environments that foster attainment of curriculum standards, research on teaching and learning environments in schools targeted for reform is needed. The purpose of this study was to investigate differences in math/science classroom environment in higher- and lower-performing Qatari elementary schools operating for three years. Results suggest a mismatch between teacher perceptions and objective observations of learning environment in both high- and low-performing schools.

Introduction

In late 2002, Qatar Law Decree No.37 established key elements of educational reform in Qatar schools including national curriculum standards; an emphasis on critical thinking through student-centered teaching; establishment of independent (charter) schools; standards-based assessment; use of English as the language of instruction in math and science, and extensive professional development for teachers. In the classroom, the reform provides "an emphasis on encouraging a spirit of inquiry and hands-on learning" (www.education.gov.qa) that is often referred to as student-centered teaching because students are involved in activities and discussions that promote students' deep conceptual learning, knowledge construction, and autonomy. In math, the standards incorporate a reasoning and problem solving strand that is different from the previous focus on drill, while in science the incorporation of an inquiry strand differentiates the curriculum from the previous one (Education Institute, 2002). This emphasis requires a change in the traditional classroom learning environment described in the analysis of the Qatar educational system prior to implementation of the reform (Brewer, Goldman, Augustine, Zellman, Ryan, Stasz, & Constant, 2006). For example, Standard 4, from the recently published National Professional Standards for Teachers and School Leaders (Education Institute, 2007), highlights the skills and dispositions that teachers need in order to be able to implement the new standards in independent schools and establishes the type of learning environments that "engage all students in purposeful and intellectually challenging learning experiences, encourage constructive interactions among teachers and students, and enable students to manage their own learning and behaviour" (p.25). The reform incorporates many aspects of current reform movements in other nations (Calderhead, 2001), and represents an important accomplishment for a small country that did not institute public schooling until 1951.

Paper presented at the Annual Meeting of the American Educational Research Association, Denver, USA, April, 2010.

While considerable study of the organizational structures and outcomes of Qatari educational reform in "Education for a New Era" initiatives has been planned and implemented (see Rand, 2007), little attention has been placed on the study of what is occurring in the site where learning actually takes place – the classroom. Little research in Qatari or other Arab classrooms has been conducted to examine the relationship between the learning environment and standards attainment or even to determine whether the classroom teaching and learning elements associated with student-centered learning environments exist. Since the reform focuses on creating learning environments that foster attainment of the curriculum standards, research on the processes and impact of classroom learning environments in schools targeted for reform is needed.

Theoretical Framework

The focus on student-centered classrooms implies that certain models of learning (Bransford, Brown & Cocking, 1999, 2000; Schunk & Zimmerman, 2008); pedagogical approaches (Grossman, 2005); and preservice and inservice professional development (Darling-Hammond, 2000; Hawley & Valli, 1999; Loucks-Horsley et al, 1998; Putnam & Borko, 2000) form the framework of the goals and activities of the Qatari reform. The constructivist-based model emphasizes the importance of engaging initial understanding of learners before conceptual change is possible; the importance of a deep foundational knowledge that allows meaningful conceptual frameworks to develop; the need to define, implement, and monitor one's learning goals and strategies; effective use of technology; development of dispositions that encourage critical thinking and reflection; and the need for professional development based on sound principles of teacher learning (Brown et al., 2000; Putnam & Borko, 2000). *Education for a New Era* focus on student inquiry, critical thinking and problem solving requires that students participate actively in classroom activities designed to foster these outcomes and that they engage in self-regulation of motivation and strategy use to emerge as independent, life-long learners (see e.g., Schunk & Zimmerman, 2008). The movement away from rote memorization places tremendous pressure on students, who must assume responsibility for motivational and cognitive processes that underlie learning, and on teachers, who must provide the kinds of instructional strategies and assessment practices within a learning environment that fosters development of student self-regulation and participation (see e.g., Blumenfeld, Kempler, & Krajcik, 2006; Bransford, Brown, & Cocking, 1999, 2000; Donovan, Bransford, & Pellegrino, 2000).

Learning Environment in Student-Centered Classrooms

Over the past three decades, the study of the psychosocial elements of learning environments has revealed strong, positive relationships with a number of cognitive and affective outcomes (Fraser & Walberg, 1991; Fraser, 1999; 2007), particularly in science and mathematics classrooms (Fraser, 1994; 1998). While initially studies were conducted primarily in western countries, recent research has found similar patterns of findings in non-western countries (Aldridge & Fraser, 2000; Fraser 2007). Although very few learning environment studies have been conducted with Arab elementary students,

findings from recent studies indicate that investigations of this type are an important contribution to the understanding of conditions related to positive classroom climate (Zedan, 2010).

Student Behaviors in Learner-centered Classrooms

Student engagement has been studied extensively in the past as a precursor and predictor of student achievement (Brophy, 2000; Brophy & Good, 1986). However, current views of student active engagement reframe the notion of time-on-task in ways that connect it more closely to the disciplines that form the context for engagement. The recent National Research Council report, *Taking Science to School* (Duschl, Schweingruber, & Shouse, 2007) refers to "productive participation" (p.194) that goes beyond mere participation to participation in ways that facilitate disciplinary learning. Engle and Conant (2002) discriminate between engagement, disciplinary engagement, and productive disciplinary engagement. Consistent with previous research, engagement involves students in speaking, listening, and working while exhibiting high levels of persistence in on-task behaviors. While this is positive, it does not ensure that students are engaging meaningfully with certain content. On the other hand, "disciplinary engagement" expands our previous notion of engagement to include content and activities specifically related to a discipline such as science. Going one step further, "productive disciplinary engagement" specifies intellectual progress as a result of this engagement and is demonstrated by change over time in "student investigations, complexity of argumentation, and use of previous investigations to generate new questions, new concepts, and new investigations" (Duschl et al,2007, p. 195). This kind of engagement depends on the discipline, task, and topic being studied and is influenced by student characteristics (e.g., motivation and attitudes) as well as teacher behaviors and classroom environment. Although this is an area of increasing interest in classroom research, few studies of productive participation have been conducted to date (Duschl et al, 2007).

Teacher Role in Student-Centered Classrooms

Because learning in schools is traditionally dominated and controlled by adults, it is not often that students make decisions about their own learning. Even though educational philosophies aim to produce graduating students who are responsible citizens capable of participating thoughtfully in society, our educational practices have a tendency to foster dependence, passivity and a "tell me what to do and think" attitude (Goodlad, 1984). In the student-centered classroom, instruction focuses on the student. Decision-making, organization, and content are largely determined by the student's needs and perceptions and even assessment may be influenced or determined by the student. In the learner-centered classroom, the role of the teacher changes to a facilitator rather than a director. This shift in teacher instruction is effective in helping students make progress in their academic achievement, social skills, and acceptance of diversity. Stuart (1997) believes that a student-centered teaching technique helps teachers and instructional designers set up an effective instructional environment for every member of the classroom, regardless of the diverse learning needs of students. Although the idea of learner-centered teaching is not new, it is a challenging task since it requires the development of instructional practice and a curriculum that has as its focus student

intellectual autonomy, motivation, persistence, and use of inquiry learning and problem-solving strategies. In a student-centered teaching environment, the instructor provides support to students, demonstrates flexibility with curriculum choices without compromising learning goals, and utilizes a variety of assessments (Motschnig-Pitrik & Holzinger, 2002). Also, the teacher facilitates active engagement of students through discussion. In contrast to the traditional classroom characterized by the initiation, response, evaluation (IRE) discourse format, student-centered classrooms feature discussion among students with teacher facilitation rather than domination (Sawyer, 2006).

Research Questions

While some educators have questioned whether western theories can be successfully applied in non-western classrooms (Zedan, 2010), recent cross-cultural research in learning environments and studies in Arab schools suggest otherwise (Aldridge & Fraser, 2000; Zedan, 2010). Therefore, additional investigation of learning environments, particularly in Arab school contexts, is warranted. The purpose of this study was to investigate differences in the classroom learning environments in higher and lower performing Qatari schools implementing the recent *Education for a New Era* reform elements which focused on transforming traditional classroom environments into more student-centered, inquiry environments. More specifically, the research questions were:

1) What are teachers' perceptions of the learning environment in math and science classrooms in Qatari elementary independent schools?
2) What are students' perceptions of the learning environment in math and science classrooms in Qatari elementary independent schools?
3) What are observed features of the learning environment in math and science classrooms in Qatari elementary independent schools?
4) Are there differences in the math and science classroom learning environments in higher and lower performing Qatari elementary independent schools?

Methods

This study employed a descriptive-correlational design using systematic classroom observation and teacher and student learning environment surveys with a stratified random sample of math and science classrooms in independent schools.

Participants

Participants for the first phase of research included teachers and students from a sample of randomly selected math and science classes in randomly selected independent elementary schools. The study was confined to math and science classes since they were the focus of new curriculum standards that specified instruction be conducted in English in math and science classrooms. Data were collected in the Fall of 2008 in 17 schools randomly selected from 46 schools that comprised the first two cohorts established as independent schools by the Supreme Education Council. Each school in our sample had implemented the Qatar standards for at least 3 years. Three to five third and fourth grade

math and science classrooms were randomly selected from these schools for participation. The sample included 67 teachers and approximately 1150 students.

The extent to which interactions and activities in the classroom were student-centered was determined through observations using two instruments: the Stallings Observation System Snapshot (SOS; Stallings, 1975) and the Teacher Attributes Observation Protocol (Fouts, Brown, & Thieman, 2002). Teachers were asked to conduct a 'typical' class on the observation day. While the observations do not provide an exhaustive profile of classroom interactions, they provide a snapshot of what is occurring on a given day in Qatari elementary math and science classrooms. The Snapshot documents the materials, activities, grouping arrangements, instructional strategies, and interaction patterns among teachers and students and establishes student engagement rate (Stallings & Giesen, 1977). The TAOP is a measure designed to capture contructivist approaches to teaching and has seven components consisting of 27 indicators. The seven components include teaching for conceptual understanding, application of knowledge to real world applications, student active participation, building on the diverse experiences of students, challenging curriculum, higher order thinking opportunities, and assessment. TAOP scales range from Not Observed (0) to Observed Very Often (4). Interrater reliability for the Snapshot was .85 and for the TAOP was .79.

Teachers and students also responded to surveys to determine their perceptions of the learning environment. Students were administered the Individualized Classroom Environment Questionnaire (Fraser & Fisher, 1991;Spinner & Fraser,2002) which consists of 25 items in five scales: Personalization, Participation, Independence, Involvement, and Differentiation. Students indicated their agreement with statements about their classroom on a five point scale ranging from Strongly Disagree to Strongly Agree. Internal consistency reliability was .79. Teachers were administered the Inventory of Teaching and Learning (ITAL; Ellet & Monsaas, 2007). The ITAL is a measure of "reformed inquiry- and standards-based and traditional teaching and learning for use in science and mathematics classrooms" that has exhibited good validity and reliability in large-scale studies evaluating National Science Foundation funded initiatives (Ellet & Monsaas, 2007, p.4). The ITAL consists of 25 likert-type items distributed across three scales: inquiry practices, standards-based teaching, and traditional teaching. Teachers were asked to determine the extent to which they emphasized certain classroom elements associated with the three scales. Scales ranged from No Emphasis (1) to Very Strong Emphasis (6). Internal consistency reliability was .94.

Results from the Qatar Comprehensive Educational Tests (QCET) which are administered in grades 4-6 each year were obtained for each school in math/science from reports of the Qatar Evaluation Institute (2009). Three classification lists were issued which, when considered together, give a picture of overall performance of schools in three areas: extent to which schools meet standards; level of academic achievement, and academic progress from 2007-2008. Each list was divided into three levels of schools depending on performance. For purpose of this analysis, sample schools in the top tier of the three lists were used to define higher-performing schools in comparison with schools in the remaining tiers which were considered lower-performing. It should be noted that achievement results cannot be matched to our sample for individual class or student analysis. While the fourth grades in our sample were included in the test results, the third

grade classrooms were not included since they were not eligible for testing until the following year. Nevertheless, the achievement results provide an indication of overall school performance within the time frame of our study.

The results yielded 6 schools in the top tier for Meets Standards, two of which were included in our sample; 18 schools in the top level of Academic Achievement, five of which were included in our sample; and 10 schools in the Overall Change Academic Outcomes 2007-2008; four of which were included in our sample. Since some schools in our sample were represented in the top of more than one level, the total number of higher-performing schools was 8 schools. From the lower-performing tiers of the three lists, 9 schools were included in our sample. However, some observation data are missing from schools in both groups.

Data were aggregated to the classroom level. Descriptive statistics were calculated for all variables. Analyses of Variance (ANOVAs) and Multivariate Analyses of Variance (MANOVAs) were used to determine differences in observations of teacher and student classroom behaviors and students' and teachers' perceptions of their learning environments by school performance level.

Results

Results for observed teacher and student behaviors, teachers' perceptions of the learning environment, and students' perceptions of the learning environment are presented in the following sections. Differences by type of school are also discussed.

Observation of Teacher and Student Behaviors

The Stallings Snapshot yielded information about the kinds of grouping used by the teacher; the activities engaged in by teachers and students, including amount of off-task behavior; and the materials used in the activities. As previously described, productive classroom participation refers to student engagement in discipline-based activities in ways that lead to self-regulation and motivation and would be considered an indicator of a student-centered, inquiry-oriented learning environment. This construct was measured by comparing the amount of off-task behavior and the kinds of activities observed. Results indicated that students overall were off-task and not productively engaged about a third of the time they spent in classes (M=29.66;SD=19.34), although there was a great deal of variation by school. This is particularly disturbing since it reflects reduced opportunity for student learning of any type. The off-task level may be related to difficulties in management of higher-level learning activities noted in previous research (See e.g., Brophy & Good, 1986; Good & Brophy, 2000; Doyle, 1986).

Activities which are associated with more student-centered instructional environments are indicated in Table 1. They included amount of discussion, project-based instruction, the use of manipulatives by students, technology integration (computers and multimedia), and cooperative learning activities. Classrooms emerged as fairly teacher-centered with over 70% of the instruction occurring in large group settings delivered by the teacher and about 25% involvement with small group or individual configurations. Student-Centeredness, as defined by the highlighted variables, was observed less than 20% of the time. Examination of the individual variables representing elements of classrooms characterized by student-centered inquiry teaching and learning

reveals some use of Discussion (M%=4.82; SD=10.99), Manipulatives (M%=4.44; SD=10.44), and Multimedia (M%=6.15; SD=14.09), but very little evidence of Projects (M%=.62; SD=4.92) or Cooperative Learning (M%=3.04;SD=8.22). However, there was a great deal of variation by school as determined by the large standard deviations. Student-Centeredness ranged from a low of 0% to a high of almost 70% across schools, but Projects and Cooperative Groups were observed infrequently in every school. Given the paucity of cooperative groups observed, the use of small groups noted previously does not appear to be in a cooperative grouping format and represents a more superficial structure. In summary, while there was a great deal of variation as noted by the standard deviations, percentages were generally low across classrooms for the discipline-based activities that might underlie Productive Classroom Participation.

While the Snapshot looked at the percent of time of activities and materials, the TAOP investigated the nature of the content of classroom instruction, activities, and materials including the depth of conceptual understanding elicited and the degree to which the curriculum was challenging for students. Constructs were measured using a scale of 0 (not observed) to 4 (observed very often). Results were low overall (M=.56;) with Real World Applications (M=.23; SD=.26), Active Student Participation (M=.37; SD=.33), and Differentiation in strategies and curriculum (M=.51; SD=.39) observed rarely. **Teaching for Conceptual Understanding (M=.86; SD = .31) and Challenging Curriculum (M=.84; SD=.03) were observed considerably more often than the other variables, but were still low. Again, there was a great deal of variation across schools.**

The results depict an emerging set of instructional strategies consistent with the direction of the educational reform in Qatar. While teacher-centered instruction prevailed, small group instruction and student-centered instruction occupied a fourth and a fifth of the time observed across schools. As might be expected, the structures such as grouping and discussion that support student centeredness were more prevalent than evidence of depth of content or active student participation. Depth may be more difficult to achieve and may emerge more slowly. However, some schools are more advanced than others and might serve as models.

Differences in Observed Behaviors of High- and Low- Performing Schools. Table 2 provides the results of the comparison of higher-performing schools (HPS) and lower-performing schools (LPS) for the SOS and TAOP. Findings indicated few differences by level of performance, perhaps because performance in general was quite low and observed behaviors related to the standards were also quite low. For observed behaviors using the Stallings Snapshot, three composite variables related to student-centeredness, described previously, were considered: Teacher interactions with individuals and small groups, Student-centered activities, and Student Off-Task behavior. Descriptively, HPSs were characterized by more teacher interactions with individual students and small groups (ES=.05) and less student off-task behavior than LPSs (ES = .53) although both groups had high off-task behavior. LPSs, surprisingly, exhibited almost twice as much student-centered activity use (ES = .41), although both groups were extremely low in this area. Differences were not statistically significantly different, although the effect sizes for off-task behavior and student-centered activities were medium, indicating some practical significance. The TAOP, which focused on instruction from a constructivist perspective consistent with the standards, provided some support when comparing the

means for more use of student-centered instruction by LPSs than HPSs, but, again, there was very low use in general by both groups; no statistically significant differences were obtained for the TAOP; and effect sizes were also small.

Teachers' Perceptions of Learning Environment

Contrary to the results of the observations, when surveyed about the learning environments they created, teachers overall reported high levels of implementation of elements associated with both Standards-based (M=5.31; SD=.55) and Inquiry teaching and learning (M=5.11; SD=.26), but much lower implementation of Traditional elements of teaching and learning (M=3.78; SD=.57). LPS exhibited higher means for Standards-based and Inquiry and lower means for Traditional. While there were no significant differences between LPS and HPS for teacher reports of either Standards-based (F=.31; p=.58) or Inquiry teaching and learning (F=1.1; p=.30), HPS teachers perceived significantly higher Traditional teaching and learning (F=5.38; p=.02). These findings are consistent with the trends noted in the observations for student-centered variables, although the differences were not statistically significant in the observation analyses.

The mismatch between teacher perceptions and observed behaviors has implications for those implementing the reform as well as those providing professional development for teachers. Perhaps teacher use of structures such as small group learning, although not necessarily accompanied by inquiry activities or conceptually challenging content, gave them the illusion of student-centered inquiry. This mismatch between actual use of a strategy and teacher perceptions of their use of the strategy may be an initial stage in moving from teacher-centered to student-centered instruction. In fact, although observations revealed low levels of emphasis on conceptual understanding and challenging curriculum, as previously pointed out, these variables were higher than other elements of student-centered inquiry instruction and may be emerging in the classroom.

Students' Perceptions of the Learning Environment

Students' perceptions of the classroom environment that facilitates development of self-regulation were somewhat mixed, but similar across types of school. Students reported high degrees of Personalization (M=4.11; SD=1.30) and Participation (M=3.66; SD=1.41) and to a lesser extent, Involvement (M=3.42; SD=1.44). However, students' perceptions of their Independence (M=2.15; SD=1.44) and teachers' Differentiation of work and activities for different students (M=2.82; SD=1.60) were considerably lower. No significant differences emerged for the two types of schools (F=.000; p=.98) and effect sizes were generally small with two exceptions. Personalization and Differentiation exhibited medium effect sizes (eta squared = .09 and .06 respectively) with Personalization higher for LPSs and Differentiation higher for HPSs. While results of the ITAL indicated that teachers perceived that they gave students opportunities for autonomy and individualized assignments and activities according to Qatari standards, students did not perceive these elements to the same extent. However, students felt that teachers gave them personal attention and cared for them and gave them opportunities for participation and involvement in class activities.

Discussion

In general, observation of student-centered practices were much lower compared to teacher and student reports of these practices and student reports of key student-centered elements were lower than teacher reports. However, some variations by achievement level were noted, with the LPS group exhibiting and teachers in the LPS group reporting greater student-centeredness. Differences across groups consistent with the findings from the observations emerged when teachers were asked about their perception of the type of instruction they provided in classrooms. Although both groups indicated that they implement high levels of standards-based and inquiry practices and lower levels of traditional instruction, teachers in the HPS group reported higher levels of traditional instruction than teachers in the LPS group.

Several explanations might address this unexpected finding that runs counter to expectations. Although the schools were randomly drawn from eligible schools, mitigating possibility of bias, not all math and science classrooms in each school were observed due to considerable absenteeism of teachers. In addition, some schools were unable to be observed due to scheduling problems. Scheduling observations was a major challenge during the study due to widespread uncertainties and last-minute changes that appear to be common in Qatari elementary schools but are very disruptive to teaching and learning. In addition, the length of the observation may not have captured the teaching and learning in the class to the extent needed, even if there were no problems with the schedule. However, the fact that multiple data sources support similar findings suggests that the shortcomings presented above probably were not responsible for the unexpected findings.

Another possibility, and one that has been common in the U.S., is that the measures used may not be consistent with the actual standards. Teaching to the test, particularly if the test is more oriented to basic skills, often works against more student-centered approaches. Traditional direct instruction has been successful in raising standardized test scores. Of note, the HPS teachers report more traditional instruction than the LPS teachers, an indication that this may be a possible factor in the results.

Another explanation is that the instructional behaviors related to inquiry teaching and standards are emerging and have not yet been implemented to the extent that we can see a relationship between achievement and instruction. Both observations and student outcomes indicate low levels of standards implementation. The top tier of Meeting Standards only achieved 10-20% of standards. The dispositions for student-centered instruction, or at least awareness of the goals, are prevalent as indicated by teacher and student responses on surveys. However, teachers and students may not yet have acquired and practiced the actual skills needed to implement student-centered instruction and impact student achievement. Actual change in performance may lag behind changes in teacher and student perceptions and dispositions due to the pressures that this approach places on students and teachers (See e.g., Boekarts, 1999; Schunk & Zimmerman, 2008). The high student off-task rate signals problems in general with management of the new and often unfamiliar behaviors related to student-centeredness. That the LPS classes have higher off-task rates and more evidence of student-centered activities, but with lower achievement supports this hypothesis. Anecdotal information also provides support. During one observation, field notes indicated that a particular teacher would turn to the observer frequently and give the ‘label’ for the instruction she was providing (e.g., “this is tying the content to student lives”). However, in most cases the observer

noted that the example was either incorrect or of low quality. The lag between recognizing and implementing standards-based instructional activities may require considerable professional development and perhaps extensive coaching.

Educational Significance

The mismatch between participant perceptions and both observed behaviors and achievement has implications for the implementation of reform in general and professional development in particular. While teachers in this study report changes in learning environments and instructional practices, these reports may be due to pressure to comply with mandated reform and/or insufficient professional development for acquisition of complex behaviors. Next steps might include examination of the measures used to gauge progress to insure a match between standards and assessment of the standards; identification and case studies of schools that are making progress with the goal of providing models that can assist teachers and administrators in implementation of the standards; and targeted professional development that goes beyond general awareness of appropriate instructional strategies and includes intensive practice and coaching with feedback. (See e.g., Hawley & Valli, 1999).

Findings from this study emphasize the 2010 AERA theme involving the study of teaching and learning in complex ecological systems since the complexity of interactions in Qatari classrooms has been heightened by demands on participants due to increased accountability and changing expectations for teacher and student learning. The outcomes of this research provide information about teaching and learning in student-centered classrooms at two levels – the professional knowledge base and the Qatar educational context.

Acknowledgements: This study was funded by a grant from the Qatar National Research Foundation, National Priorities Research Program, Grant # 13-6-7-1.

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Table 1: *Means and Standard Deviations of Selected Variables from Classroom Observations (SS; and TAOP); Teacher Learning Environment Survey (ITAL); and Student Learning Environment Survey (ICEQ)*

I. CLASSROOM OBSERVATIONS

A. Teaching Attributes Observation Protocol* (n=56)

	Conc	Refl	Appl	Part	Diff	Curr	Assess
TOTAL SCALE							
M	.86	.63	.23	.37	.51	.84	.48
SD	.31	.30	.26	.33	.39	.03	.01

*Scales range from 0 (Not Observed) to 4 (Observed Very Often)

B. Stallings Observation System Snapshot (n=56)

	Mean %	Mean SD
GROUPING		
1 student	8.89	17.52
Small	17.38	18.53
Large	48.04	29.64
All	24.10	24.28
STUDENT INVOLVEMENT		
*Discussion	4.82	10.99
Practice/drill	4.91	10.01
Kinesthetics	2.89	6.42
*Projects	.62	4.92
Classroom Management	3.40	7.64
Receiving Assignments	9.16	16.22
Computers/Calculators	.63	3.53
*Manipulatives	4.44	10.44
*Multimedia	6.15	14.09
Visual Aids	24.58	20.11
*Cooperative learning	3.04	8.22
No Materials	41.83	21.23
Total Student Off Task	29.66	19.34
TEACHER INVOLVEMENT		
Monitoring Seatwork	10.56	17.60
Interactive Instruction	67.25	24.88
Organizing/Managing	20.29	22.47
Working Alone	1.59	5.45

*Indicates a student-centered activity

II. TEACHER SURVEY

Inventory for Teaching and Learning* (n=69)

	Standards		Traditional		Inquiry	
	M	SD	M	SD	M	SD
TOTAL SCALE	5.31	.55	3.78	.57	5.11	.26

*Scales range from 1 (No Emphasis) to 6 (Very Strong Emphasis)

III. STUDENT SURVEY

Individualized Classroom Environment Questionnaire* (n=1151)

	Personaliz	Particip	Independ	Involv	Different

TOTAL SCALE					
M	4.11	3.66	2.15	3.42	2.82
SD	1.30	1.41	1.41	1.44	1.60

*Scales range from 1 (Strongly Disagree) to 5 (Strongly Agree)

Table 2: *Means and Standard Deviations of Classroom Observations (SS; and TAOP); Teacher Surveys (TE and ITAL); and Student Surveys (ICEQ and HDYSP) by High- and Low-Performing Schools*

I. CLASSROOM OBSERVATIONS

A. Teaching Attributes Observation Protocol*

	High-Performing (n=6)	Low-Performing (n=9)
M	.44	.60
SD	.23	.33

*Scales range from 0 (Not Observed) to 4 (Observed Very Often)

B. Stallings Observation System Snapshot

	High (n=6)		Low (n=9)	
	M	SD	M	SD
Groups				
1 student or small group	14.19	13.19	13.46	13.9
Student-Centered activities	2.25	3.73	4.19	5.74
Student Off-Task Behaviors	30.59	20.92	40.8	13.35

II. TEACHER SURVEYS

A. Teacher Efficacy*

	High-Performing (n=7)		Low-Performing (n=8)	
	M	SD	M	SD
GTE	4.20	1.69	4.25	1.55
PTE	5.42	.79	5.43	.67
Total	4.82	1.24	4.84	1.11

*Scales range from 1 (Strongly Disagree) to 6 (Strongly Agree)

B. Inventory for Teaching and Learning* (n=69)

	High-Performing (n=7)		Low-Performing (n=8)	
	M	SD	M	SD
Standards	5.25	.81	5.40	.89
Traditional	3.91	1.30	3.78	1.46
Inquiry	5.09	.81	5.22	.82

*Scales range from 1 (No Emphasis) to 6 (Very Strong Emphasis)

III. STUDENT SURVEYS

A. Individualized Classroom Environment Questionnaire*

High-Performing (n=8)		Low-Performing (n=9)	
M	SD	M	SD
3.29	.91	3.27	.77

*Scales range from 1 (Strongly Disagree) to 5 (Strongly Agree)

B. How Do You Solve Problems*

High-Performing (n=8)		Low-Performing (n=9)	
M	SD	M	SD
4.05	1.18	4.02	1.19

*Scales range from 1 (Strongly Disagree) to 5 (Strongly Agree)