SCHEDULING INEQUALITY IN MATH AND SCIENCE: HOW TRIMESTERS HURT STUDENTS AT RISK OF ACADEMIC FAILURE

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ABSTRACT

Although many high schools are switching from a semester to a trimester schedule as a response to increased high-school graduation requirements, there is very little empirical research on trimesters. In this ethnographic case study (2006-2009), we observed 22 math and science classrooms, interviewed seven administrators, two counselors and 22 teachers, and examined documents in order to understand what happened when one high school in Michigan switched to trimesters. Our findings reveal that the trimester schedule results in loss of instructional time, which reduces students’ opportunities to learn. Although the switch to a trimester schedule was made to help struggling students meet the new graduation requirements, trimesters inadvertently hurt students already at risk of academic failure. Our findings suggest that struggling students will probably benefit from more time to learn content. We also recommend content-specific professional development for both teachers and administrators.
The expectations for American high school students have steadily increased to the point where 20 states now mandate college-preparatory curriculum for all students (Achieve, 2010). Attempts to meet these high standards have led many educators to seek flexible alternatives to the traditional six- or seven-period day (Canady & Rettig, 1995). Yet, there are no conclusive findings regarding the effectiveness of alternative schedules, such as block schedules (Lewis, Winokur, Cobb, Gliner, & Schmidt, 2005). In fact, block scheduling is one of the most hotly debated reform efforts at the high school level (Zepada & Mayers, 2006).

One form of the block schedule that is increasing in popularity is the trimester schedule. For example, since 2006, a third of Michigan public high schools either has reorganized or is in the process of reorganizing to block schedules under the trimester format (Trimesters.org, 2010). The problem is that there is very little empirical research on trimester schedules, especially in the context of rigorous high school graduation requirements and high-stakes testing (Brower & Moran, 2009). Instead, much of the published literature is either testimonials or anecdotal accounts of the benefits of the trimester schedule (McCreary & Hausman, 2001).

The purpose of this paper is to address this gap in the literature. We present the results of a three-year ethnographic case study that examined the process of adoption of a trimester schedule at one Michigan high school. Michigan provides an ideal setting to study the adoption of the trimester in the context of high-stakes testing because the change to trimesters is a direct response to new rigorous high school graduation requirements called the Michigan Merit Curriculum (MMC), which were signed into law in 2006.

An in-depth study of one high school allowed us to examine the nuanced responses, at the school, classroom, and individual level, to a switch from a traditional, two-semester schedule to a trimester schedule. We describe the rationales for the switch to trimesters, examine the process of transitioning to trimesters, and analyze some of the consequences of the switch on math and science curriculum and instruction, and on the opportunities for struggling students to learn. In this paper, we argue that although the switch to a trimester schedule is purportedly being made to help students meet the new graduation requirements, trimesters inadvertently hurt students already at risk of academic failure.

**REVIEW OF LITERATURE**

**TRIMESTER SCHEDULE**

Block scheduling is a modification of the traditional six-hour school day of...
57-minute class periods. While many variations exist, the general goal of block schedules is to allocate longer periods for instruction in core subjects, leading to longer, but fewer, class periods per day. One type of block schedule is the 4X4 block, which has 90-minute class periods, with four classes taken every day for a semester. Another form is the A/B schedule or alternate day schedule, where three or four 90-minute classes are offered on alternating days, with classes lasting for the duration of the whole year (Canady & Rettig, 1995). A third form is the trimester, where the school year is divided into three trimesters (60 days per term), each of which includes four or five academic periods (Stanley, Spradlin & Plucker, 2007).

**Impact of Block Schedules**

Many high school educators have switched to block schedules believing that this switch will raise student achievement (Bevevino, Snodgrass, Adams, & Dengel, 1998; Canady & Rettig, 1995; Cobb, Abate, & Baker, 1999; Queen & Isenhour, 1998). However, McCreary and Hausman (2001) report that students at schools on the trimester schedule had lower GPAs and lower SAT math scores than those on the traditional schedule. On the other hand, they also report that students on the block and trimester schedule had higher science scores on the SAT than students on the semester schedule. Overall, there is no conclusive evidence that a structural change alone will lead to improved student achievement (Biesinger, Krippen, & Muis, 2008; Brower & Moran, 2009; Stanley, Spradlin, & Plucker, 2007).

Educators who advocate for block schedules also believe that the longer class periods would lead to more student-centered instruction. However, findings regarding the relationship between schedule and instructional strategies are mixed. While Veal (2000) reported that, under a block schedule, science teachers utilized more student-centered instruction (such as group work, projects and individualized instruction), teacher-led instruction still prevails in classes under the block schedule (Biesinger, Krippen, & Muis, 2008; Jenkins, Queen, & Algozzine, 2002; Maltese, Dexter, Tai, & Sadler, 2007).

**Need for the Study**

One problem with the research on block scheduling is that many published studies do not provide adequate information about the type of schedule adopted. They group all block schedules as a single intervention making it hard to determine the type of schedule adopted. Moreover, many of the studies on block scheduling do not provide adequate information about the context in which the studies were conducted. Few recount the school’s experience in implementing the new schedule. (Zepada & Mayer, 2006)
Therefore, little is known about the contextual factors that might affect the success, or lack thereof, of trimesters in meeting rigorous exit requirements, especially in high schools that have large numbers of students who are traditionally not college-bound. Consequently, it is hard to determine how structural change affected instruction or achievement.

There is clearly a need for “qualitative studies that explore why block scheduling works or does not work” (Lewis, Winokur, Cob, Gilner, & Schmidt, 2005, p. 25). It appears that there has been a “neglect of the experiences, perspectives, and emotions of actors who are charged with the implementation of policy and the social, cultural, political, economic, and emotional contexts in which it takes place” (Troman, Jeffrey, & Beach, 2006, p. viii).

**METHODS**

We selected an ethnographic case-study research design because the long-term engagement in the field, extensive observations, and personal contact with the participants was necessary in order for us to understand the nuanced processes at work as a school transitioned from a semester to a trimester schedule.

**SITE AND SAMPLE**

We selected our site, Reform High School (RHS, a pseudonym), because it was an early adopter of the MMC. Although the new high school graduation requirements did not go into effect until fall 2007, RHS adopted these requirements in the fall of 2006. RHS is a large, comprehensive, and diverse high school located on the fringe of a large city in the Midwestern region of the United States. The school enrolls over 2,800 students.

In 2006, the student body was 57% White, 28% Black, 7% Hispanic, and 7% Asian. Over 40% of students qualify for the free and reduced lunch program. RHS has received numerous awards in recent years, indicating its status as an excellent school.

We utilized purposive sampling (Patton, 1990) to identify the individuals who were most affected by the MMC. Although initially we planned to talk to teachers from all core subject areas (math, science, English and social studies), as we uncovered unique challenges presented by the sequential nature of math and science, our study became progressively focused on the staff and curriculum of the math and science departments.

**DATA COLLECTION**

We have spent three years (2006-2009) in the field. Regular visits enabled us to develop relationships with the participants, and the time in between
visits gave us the time to read, reflect, and write about our visits. Our role in
the school was that of non-participant observers.

Our primary source of data was interviews. Each year of the study, we
conducted semi-structured interviews (Patton, 1990) with the assistant su-
perintendent for curriculum, the district coordinator for math, the principal
of the freshman campus, the principal of the 10-12 building, the assistant
principal in charge of scheduling, two guidance counselors and 22 math
and science teachers. Informal conversational interviews (Patton, 1990)
with teachers helped us clarify issues that arose during observations and
conversations with administrators and other teachers.

In order to see how the structural changes affected instructional strate-
gies, we observed math and science classrooms taught by the teachers whom
we were interviewing. We observed 22 classes of the following subjects:
algebra I, algebra II, geometry, biology, chemistry, and physics. The observa-
tions raised questions that we clarified during our interviews and, in turn,
the interviews raised issues that we verified during subsequent observations.

Artifacts analyzed in this study included the Michigan Merit Curriculum
(available on the Michigan Department of Education website, MDE.org),
school curriculum handbooks, the master course schedule, school policy
statements, and school and community newspapers.

**Data Analysis**

As a qualitative study, data collection and analysis occurred simultaneously,
with initial analyses enabling deepening insights, which in turn guided sub-
sequent data collection (Kirby & McKenna, 1989). Data analysis occurred in
two modes: the first analysis was concurrent with, and therefore informed,
data collection; the second, more formal analysis, occurred once each
school year ended (Bogdan & Biklen, 1992). At the same time, in order to
draw connections between our study site and the broader context, we read
the professional literature on school reform and followed the discussions
in the local media about the impact of the MMC on local school districts.

All observations and interviews were transcribed into field notes at the
end of each day. We wrote memos about patterns that were emerging, our
methodology, and questions that needed to be answered. While such analy-
sis was ongoing, the majority of the analysis occurred at the end of each
school year when we re-read the entire collection of field notes.

Content analysis of documents involved structural and interpretive
analysis (Fraenkel & Wallen, 2009). We noted the new courses that were
added, old courses that were eliminated, and other changes in the schedule.
Interpretive analysis of field notes was guided by the constant comparative
method (Strauss & Corbin, 1990).

Periodically, we checked our interpretations with the participants in order to make sure we were truly representing their perspectives. However, because this is a naturalistic study and we did not want to influence their decisions, we did not provide any formal report to the school. We will do so when the study is complete.

**Findings**

We first present the school’s rationale for the switch to trimesters and then we discuss the contextual factors that affected the adoption of trimesters at Reform High School. We conclude with an examination of some of the consequences of the switch to the trimester schedule.

**Rationale for Trimesters**

The administrators at Reform High School gave several reasons for the decision to switch from a semester to a trimester schedule. The first reason for the switch was to meet the demands of the new high school graduation requirements. According to the MMC, in order to graduate from high school, all students need to earn 16 credits: four each of math and English, three credits each of science and social studies and one credit each of physical education and art. All 11th grade students are also required to take the Michigan Merit Exam (MME), which includes a college entrance exam, the American College Test (ACT). Although students do not need to pass MME in order to graduate, the federal No Child Left Behind Act (NCLB) mandates that student performance on the MME will determine whether the school is making adequate yearly progress (AYP) toward 100% proficiency by 2014.

Administrators hoped that the trimester schedule would help students meet the new, rigorous standards. They hoped that the longer class periods afforded by trimesters would provide time for teachers to cover all content expectations spelled out by the Michigan Department of Education (MDE). An examination of the MDE website related to the MMC (under Frequently Asked Questions) revealed that the trimester schedule was indeed one of the suggested schedules for dealing with the new requirements (MDE, 2008a).

Second, administrators expected many students to fail the new, rigorous requirements, especially algebra and chemistry. As an administrator explained:

Under the semester schedule, say a student failed algebra Ia first term and retook the course the second term, they would have to wait until the next school year to get to algebra Ib. These kids will not be able to graduate in four years.
The trimester schedule was adopted in anticipation of such failures. “Trimesters allow students who fail a course in the first trimester to retake it during the second or even third trimester and still be able to graduate on schedule,” explained the administrator.

Finally, the switch to trimesters was to provide room in the students’ schedules for electives. Since there were so many new core courses required for graduation, the staff felt that there would be little time available for electives. Under the semester schedule, there were 12 slots per year available for courses. “Trimesters,” on the other hand, with 15 slots per year, “allow time in students’ schedules for electives,” explained an administrator. Both teachers and administrators felt that electives, like art and music, were vital to many students. “Some kids need those electives,” they explained; “that is the only reason they come to school.” The school counselor verified the students’ enthusiasm for trimesters: “Hundred percent of the kids want trimesters for the choices of electives it gives them.”

In transitioning from semesters to trimesters, administrators at Reform High School seem to have regarded the trimester as an end in itself rather than a means to an end. Consequently, they kept their attention on the organizational features of the change, not on the resultant instructional impact. They met with administrators from other schools under the trimester schedule and discussed issues related to the master schedule, such as actual number of minutes per class period, assignment of core and elective teachers, and the schedule of music and advanced placement courses. Similarly, the head counselor from Reform High School met with other counselors to discuss issues related with scheduling students to courses.

Teachers, on the other hand, received no preparation for the switch to trimesters. The year before the switch, the administrator of a neighboring district, a well-known advocate of trimesters, spoke to the entire staff. He was persuasive and teachers agreed to the switch. However, there was no professional development regarding the details of how to adapt curriculum and instruction from a semester to a trimester format. In the words of a math teacher:

On the PD before the school year, we talked about bully prevention – but not about how to teach the new curriculum on trimesters.... It would have been nice to see how other high school math teachers have organized the curriculum for trimesters.

Teachers were told to figure out the details on their own. “We were given the standards – here they are - and told to follow them,” said a math teacher.
During the first year, we often heard phrases like, “We are flying by the seat of our pants” and “We are figuring this out on the fly.”

**Context Matters**

The trimester format was adopted at Reform High School concurrently with the new graduation requirements (MMC) and the new exit exam (MME). At the same time, the school also decided to eliminate all non-college-preparatory courses in math and science so that the lowest level of courses in these areas were 9th grade algebra and 9th grade biology. Therefore, it is not possible for us to separate out the effect of the trimester schedule from that of the increased standards or from that of de-tracking. The effects of these changes are inexorably intertwined; together, they had a negative impact on students already at risk of academic failure.

**Increased content.** The first problem confronting the teachers was that Michigan’s new graduation standards were now among the most rigorous in the country. All students were expected to pass algebra II and a fourth year of math in order to graduate. Students were now also expected to complete three years of science including biology, chemistry or physics, and a third year of science.

In addition to naming the courses, the state has also spelled out numerous and specific content expectations. The expectations are intended to provide all educators and students with a common understanding of what high school students should know and be able to do at the completion of each course.

“The state lists a massive number of standards that needed to be covered. They are a mile wide and an inch deep,” explained a district level administrator. For example, an examination of the high school content expectations (MDE 2008c; 2008d) reveals 163 expectations to be covered in biology, 152 in chemistry, and 157 in mathematics. The challenge for the teachers was to figure out a way to cover all the required content.

**Less time for instruction.** Under the trimester schedule there was less time to cover the content. For example, usually a course, such as algebra, would be covered in two parts, over two semesters of 18 weeks each with algebra Ia the first 18 weeks and algebra Ib the second 18 weeks. However, under trimesters, algebra Ia would need to be covered in 12 weeks instead of 18. This meant that 30 instructional days were lost each term.

According to the administrators, the lost days were made up by the fact that under the trimester schedule each class period was longer, 71 minutes instead of 57. However, a quick calculation reveals that 57-minute classes provided for 5,130 minutes of instructional time over the course of one
semester; a 71-minute class had only 4,260 minutes during one trimester. This 870-minute difference amounted to 14.5 hours less instructional time per class, per term.

Furthermore, teachers explained that having 14 additional minutes per day under trimesters did not necessarily translate into more time for instruction each day. Some teachers told us that, realistically, not all 71 minutes of each day could be used for instruction. “There is only so much you can do during a class period. Maybe some more explanation or some work time in class. But it does not allow time to begin a new topic or lesson,” explained a biology teacher. One math teacher who taught sections of algebra to students who had failed it several times explained, “Only about half an hour is productive. Their attention span is small.”

Finally, teachers said that each trimester really only allowed for 10 weeks of instructional time, not 12 as alleged; the first week was largely spent getting to know the students and establishing classroom routines while the last week was used for exams. The net result was that teachers had substantially less time for instruction during trimesters than semesters.

Unprepared students. Exacerbating the problem of more content to be covered in less time were the many students arriving at the high school college-preparatory classes without adequate prior knowledge. Historically, low-achieving students from middle school were tracked into non-college-preparatory high school courses such as math essentials, integrated math, or integrated science. With the adoption of the Michigan Merit Curriculum, these students were now enrolled in 9th grade algebra or 9th grade biology. Their lack of preparation needed to be addressed before they could learn new concepts. According to a science teacher, “the reason they do badly in chemistry is reading comprehension and math skills. They need to be taught to stop and look at tables, but there is no time for such remediation.”

Consequences of the Changes

Fast pace. At Reform High School, the combination of the long list of state-mandated standards to be covered and the shortened time afforded by the trimesters resulted in a frantic pace of instruction.

One math teacher explained, “I think it is reasonable to cover all the standards. But not reasonable to cover it in one trimester.” This sentiment was echoed by a science teacher who felt that trimesters moved “too fast to meet the standards.” In order to cover the necessary content, math teachers felt that they were “sprinting from the beginning.” “It is a strenuous pace,” one math teacher told us. Science teachers also expressed concern that the “pace of trimester is really too fast. It feels like dragging kids by the bumper
of a car. There is no down day.” “It is pedal to the metal at all times,” said another science teacher.

According to the teachers, the Michigan Merit Curriculum had listed so many standards that needed to be covered that, rather than adopting student-centered practices, the goal became covering the essential content before the trimester was over. “It is the m and m method,” one science teacher jokingly told us, “mention and move on.”

**No time for inquiry.** In the majority of the math and science classrooms that we observed, especially in those that had many repeaters, lecture was the predominant mode of instruction, with some teacher-directed activities. Teachers were not “uncovering useful and connected knowledge,” but instead were simply trying to “cover the content,” the very practice cautioned against in the documentation of the Michigan Merit Curriculum (MDE, 2008b). This was because, as one science teacher explained,

> In the trimesters, there is not time for inquiry-based learning. Labs get cut out because they are a more time consuming way to learn and there is not that time in trimesters. This is a real loss, as science can be made more relevant and interesting to students when they are engaged in the science process. (p.6)

Another science teacher explained that under the trimester schedule there was less time for problem solving, critical thinking, graph reading, developing students’ skill in how to think like a scientist, helping students learn how to set up experiments... but with so much content in all of the standards there is really no time for inquiry learning.

**Less soak time for students at risk of failure.** The compressed 12-week term was especially detrimental to students who were already at risk of failure. Under the trimesters, these students did not have enough time to absorb and assimilate information before they were presented with more, new information. A math teacher explained:

> Under semesters, there were 30 more days to teach the subject and four more weekends for students to work. This element of the schedule and the loss of time for students to think and work were not really addressed when making the move to trimesters.

This sentiment was reiterated by a biology teacher who introduced the concept of time needed to process information. “Trimesters,” he said “do not give students enough soak time.” He explained that the condensed
instructional time was conducive to content transmission but that inquiry skills, abstract reasoning, and just plain difficult, sequential subjects required “soak time…..time to process, think, and reprocess.” The soak time provided by the number of evenings and weekends, which the students had under semesters, was irretrievable under trimesters. A math teacher pointed out the irony of the situation:

In the middle school, the brightest kids get algebra in two semesters - over 1 year. Here our weakest students are trying to take it in two trimesters or 2/3 of the time. That is ridiculous… If we had more time all could do significantly better.

**Gap between semesters.** Exacerbating these learning problems was the gap between terms. For example, some students took the first half of algebra in the first trimester, no math in the second trimester and then the second half of algebra in the third semester. What was even worse, we were told, was having a 10th grade student in the second trimester who had not taken math since the 2nd trimester of 9th grade. The gap of nine months in time led students to forget content. Class time had to be spent reviewing pre-requisite information before the teacher could move on to new concepts.

**Failure to demonstrate adequate yearly progress.** In 2007, a year after the adoption of the new state standards and the trimester schedule, RHS did not demonstrate AYP; 277 of 620 (45%) students at Reform High School did not meet the math proficiency standards as measured by the new Michigan Merit Exam. In 2008, 283 of 578 (48%) were designated not proficient in math. (Compared to this, in 2006, 37% of students were labeled not proficient on the Math portion of the Michigan Educational Assessment Program.)

When reasons for this failure rate were examined, teachers pointed out that it was not possible to cover all the content in the trimester format, especially in classes that had students who were “struggling” academically. Although sympathetic to the concerns of the teachers, an administrator felt that the fault lay not in the trimester schedule, but in the manner in which the teachers were approaching the problem:

Trimester has been a paradigm shift for teachers….They are spending time on skills that kids already know…teachers just start at chapter 1 and go till chapter 10... ‘this is what I have always done’ is what they think… Instead they should think ‘this is what is on the ACT, this is what the state says we have to do’….or they could pre-test and figure out where the students are and teach them accordingly…Teachers hurt themselves.
Focus on test preparation. When the school failed to demonstrate AYP, rather than re-examine the trimester format, district administrators decided to reduce course content. A math teacher explained: “We did not meet AYP so we are cutting out stuff that is not on the MME.” Under guidance from the district office and the intermediate school district, math and English teachers reduced the state standards down to “power standards”; content that directly addressed the high-stakes exam. These power standards became the de facto curriculum. “In algebra II we are working with the power standards. Now they have cut out content and only the MME and ACT standards are being covered,” explained a math teacher.

According to one of the teachers, the rationale for including content to be taught was guided not by the conceptual logic of the discipline but by the Michigan Merit Exam.

More computation, less theory, less logic. I’ve been forced to cut out key concepts from geometry. No more proofs. Why? Because they are not on the ACT. No compass, no compass in geometry?

This was corroborated by another math teacher who said, “There is no connection when kids say ‘Why are we doing this?’ – Only for the test – We are doing memorizing instead of understanding.”

In addition, teachers were directed to spend time in each course on test preparatory activities. “I’m just teaching to the test – 5 days out of 180 is on MME practice. I have to teach them how to pass a test – not how to be a mathematician,” complained a frustrated math teacher.

Nonetheless, the strategy worked. In 2008/09 school year, the number of students not proficient in math dropped to 40% (211/527). The school was labeled as making adequate yearly progress (AYP).

Loss of electives for students who fail. The need to demonstrate AYP overtook the concern for student electives. When students failed, they needed to retake required courses. This meant that they had to give up their electives. As the numbers of students failing classes grew, and some students failed repeatedly, teachers devised new electives to address the needs of these students. These electives included remedial courses and courses that focused on test preparation strategies. “If they are at risk they have to give up an elective and enroll in math lab,” explained an administrator. In addition, “ACT prep is a required elective for those who are at risk,” explained the teacher who was responsible for teaching this class on test-taking strategies. By the third year, other compulsory electives emerged called “credit recovery” courses. Students who had failed a course received individualized
computer-based instruction, with drill and practice, until they passed the required course units.

One of the original reasons for the adoption of trimesters was that it provided more room in student schedules for electives, electives that might have been lost because of increases in core requirements. Our findings reveal that the hope of more electives, an influential factor in the decision to move to trimesters, was lost for the “struggling” students, the very students who were thought to need these electives in order to stay motivated and engaged in school.

**Beneficial to high achievers.** Although trimesters created more challenges for the low achieving students, all the teachers believed that trimesters were beneficial for high achievers. Since core content was covered in two of the three trimesters, successful students could either take electives or choose to take core subjects in all three trimesters, completing three courses in two years and thus get ahead. This process is called looping. “This is great for the accelerated kids. They can move ahead faster and end up dual enrolling in college courses by their senior year,” explained a counselor.

Gradually, the students who looped became concentrated in the accelerated or advanced sections of the core subjects, distinguishing them from the regular paced sections and from the remedial sections where students were repeating a course. Additionally, the most advanced courses, the advance placement (AP) courses, were spread out over three terms. Thus, the most advanced students received instruction for 36 weeks, enabling teachers to go in-depth into content. In contrast, “struggling” students covered algebra or chemistry in only 24 weeks.

Thus, our findings lead us to conclude that although the switch to a trimester schedule was made at Reform High School in order to help students at risk of academic failure meet the new graduation requirements, trimesters inadvertently hurt these very students.

**Discussion**

Schools have switched to block schedules, such as trimesters, hoping that the longer class periods will allow students variable amounts of time for learning and enable deeper engagement in coursework without hurting those who need more time to learn (Canady & Rettig, 1995; Stanley, Spradlin, & Plucker, 2007). Our findings suggest that the fast pace of trimesters, without adequate “soak time,” hurt students who were already at risk of failure. They do, however, enable advanced students to move ahead, potentially exacerbating the achievement gap.

One reason for this is that although there are a few more minutes in
each class period, total time in class was less, and there are fewer weekends and evenings for students to process the information. We found that the combination of increased content and a compressed term seems to have caused students to struggle with math. McCreary and Hausman (2001), who found that students in the trimester schedule had lower SAT math scores than students in the semester schedule, hypothesized that this might be because of the sequential nature of math. Students benefit from meeting regularly over the entire school year. This is not possible under the trimester structure because math courses are typically completed in two of the three terms.

Research by Gallo and Odu (2009) has shown that when a lot of information is compressed into a short time frame, students might be resorting to rote learning rather than making meaningful connections. On the other hand, learning and practice opportunities that are spread out over time are more effective for long-term learning. If students who struggle academically are to meet college-preparatory requirements, perhaps they need more time to learn, taking classes that span the entire school year of 36 weeks.

It has also been hypothesized that the longer times of block scheduling allows more time for in-depth exploration of fewer concepts and thus facilitates conceptual learning in science (Jordan & Padilla, 1999; Stanley, Spradlin, & Plucker, 2007). We did not find this at Reform High School. The longer class period might have worked for the in-depth coverage of fewer concepts. Unfortunately, the Michigan standards call for the coverage of more concepts, not fewer. However, these specific standards were intended to bring all students to a higher level, the sheer volume of content standards to be covered in a short trimester term resulted in teachers rushing from topic to topic. Conceptual connections were lost, and absent or struggling students were left behind. This finding that, under block scheduling, teachers are unable to cover the breadth of content possible in a traditional schedule has been described as the “touchstone for one of the main controversies in the block scheduling field” (Lewis, Winokur, Cobb, Gliner, & Schmidt, 2005, p. 4).

Trimesters might work in a state where the standards are not so numerous or so specific, or in a district with high achieving students. On the other hand, districts with large numbers of students at risk of academic failure need to consider carefully the consequences of a move to a trimester schedule.

Our findings also reveal a problem with the way the trimester schedule was implemented at Reform High School. It appears that administrators regarded the trimester as an end in itself rather than a means to an end. They focused on the administrative and organizational details not the instructional aspects. However, research shows that simply opening up access to college-
preparatory curriculum does not necessarily lead to better student outcomes (Teitelbaum, 2003). We feel that administrators need content-specific professional development that will enable them to be “both successful school managers and strong instructional leaders” (Leonne, Warnimont, & Zimmerman, 2009, p. 95). This content-specific information might help them understand the complexity of what is being asked of classroom teachers.

The combination of increased standards, high-stakes assessments, large numbers of students who were unprepared for college-preparatory courses, and a shortened trimester term created at Reform High School what one math teacher called “a perfect storm.” Unfortunately, teachers in this school were not provided with adequate professional development to navigate this storm. Some have concluded that if teachers are not trained in strategies for using the extra daily time afforded by block schedules, they fail to make effective use of this time for their students (Jordan & Padilla, 1999; Silva, 2007). They caution that structural change in and of itself will have only a marginal effect on instructional strategies used by the teacher.

We recommend content-specific professional development for teachers. This will enable them, individually and collectively, to deal with the multiple impacts of the schedule changes. The professional development needs to empower teachers to assume a more active role in “the reform of curriculum, pedagogy, and assessment” (Little, 1993, p.134). They need guidance on how to teach college-preparatory math and science curriculum to heterogeneous groups of students (Boaler & Staples, 2008; Watanabe, Nunes, Mebane, Scalise, & Claesgens, 2007). Teachers could benefit from professional development in the form of content-focused coaching as recommended by West, Resnick, Harwayne, & Staub (2003).

Our study has unearthed some questions that we think are worthy of future research. What is the impact of trimesters on core areas other than math and science? Are there instances of successful implementation of trimesters in the context of rigorous high school graduation requirements, especially in schools that serve students at risk of academic failure? What is the nature of professional development necessary for administrators and teachers who are charged with the responsibility of implementing educational reform? These questions need to be explored more fully before we inadvertently schedule inequality for another generation of students.

REFERENCES


