Trends and Issues in High School Scheduling

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Agenda

- Introduction
- A Brief History of High School Scheduling
- Analyzing and Comparing the Most Common High School Scheduling Formats
- Evaluating the “Infrastructure of the School Scheduling Processes”
- Research
- Using Time to Meet the Needs of Students
- Staff Development Needs
- Teaching in the Block
- Recommendations for Successful Implementation

Universal School Time Issues

- **How much time in total?**
  - Length of **school day**
  - Length of **school year**
- **How will time be allocated among possible uses?**
  - **Core-**LA/R., Math, SC, SS, (FL?), etc.
  - **Encore-**Fine arts, performing arts, practical arts, technology, PE/H, (FL?), etc.
- **How will school time be structured?**
  - **Terms-**Traditional, year-round, semesters, quarters, 45-15
  - **Daily-**Periods or blocks (semantics), core, encore, special services, remediation, teacher planning
  - **Class size-**HR as the unit of scheduling, larger or smaller groups

How should school time be allocated? Controlling factors…

- Macro-Graduation requirements over four years
- Less Macro-Allocation of time to individual courses through scheduling
- Micro-Allocation of time to topics within courses and class periods

Factors Influencing Achievement

School	**Opportunity to learn** **Time** **Monitoring** **Pressure to achieve** **Parent involvement** **School climate** **Leadership** **Cooperation**
Teacher	**Instruction** **Curriculum design** **Planning**
Student	**Home atmosphere** **Prior knowledge** **Aptitude** **Interest**

Marzano, 2003

Factor	Avg. ES	Percentile Gain
Opportunity to Learn	**.88**	**31**
Time	**.39**	**15**
Monitoring	**.30**	**12**
Pressure to achieve	**.27**	**11**
Parental involvement	**.26**	**10**
School climate	**.22**	**8**
Leadership	**.10**	**4**
Cooperation	**.06**	**2**

Marzano, 2003

1. <u>Opportunity to Learn</u> - the extent to which the school ensures that the specified curriculum is being followed and that the curriculum includes content on which student achievement is assessed.

To what extent does your school provide explicit guidelines in terms of the content to be taught in classes?

To what extent does your school monitor the extent to which the content guidelines are being followed?

To what extent does your school monitor the extent to which the content in the curriculum covers the material on the assessment(s) used to judge student achievement?

2. Time - The amount of time the school dedicates to instruction

To what extent is your school aware of the time it devotes to instructional versus non-instructional activities?

To what extent does your school maximize the amount of time scheduled for instruction?

To what extent does your school monitor the extent to which classroom teachers maximize their instructional time?

Criteria for Comparison of Schedules

- Time per course
- Choices available
- Cost
- Student Load
- Teacher Load
- Percentage of Core (assuming 1 class (period or block) of E,M,SS, and SC per year)
- Meeting format: daily (yearlong), every-other-day (yearlong), daily (semester)

6-Period Day

Period 1
Period 2
Period 3
Period 4
Period 5
Period 6

- Time per course-57 x 180
- Choices available-6
- Cost Factor- 5/6 (83%)
- Student Load-6
- Teacher Load-5
- Percentage Core-67%
- Meeting format: daily-yearlong

6-Period Advantages

- Daily meeting
- Total time per course-More than all but 6 A/B
- Percentage of core-67% is more than all others and equivalent to the 6 A/B
- Cost- Same as 6 A/B; more than 6/7 or 7/8; less than all others.

7-Period Day

Period 1
Period 2
Period 3
Period 4
Period 5
Period 6
Period 7

- Time per course-48 x 180
- Choices available-7
- Cost Factor- 5/7 (71%), 6/7 (86%)
- Student Load-7
- Teacher Load-5 or 6
- Percentage Core: 57%
- Meeting format: daily-yearlong

7- Period Advantages

- Daily meeting
- Total time per course (less than 6-period, 6 A/B and 7 A/B; more than 8-period, 8 A/B, 4X4, and Hybrid 4X4
- Percentage of core (less than 6-period and 6 A/B; more than 8-period, 8 A/B, 4X4 and Hybrid 4X4)
- Choice (one more than 6-period; one less than 8-period, 8 A/B, 4X4, and Hybrid 4X4)

8-Period Day

Period 1
Period 2
Period 3
Period 4
Period 5
Period 6
Period 7
Period 8

- Time per course-43 x 180
- Choices available-8
- Cost Factor- 5/8 (62.5%), 6/8 (75%), 7/8 (87.5%)
- Student Load-8
- Teacher Load-5, 6, or 7
- Percentage Core: 50%
- Meeting format: daily-yearlong

8- Period Advantages

- Daily meeting
- Choice (Same as 8 A/B, 4X4, and Hybrid 4X4; more than all others.)
- Flexibility for double-dosing

How many periods?

9, 10……

Why Have Schools Moved to Block Schedules?

- To maintain/expand choice in the face of increasing core credit requirements for graduation,
- To improve school management,
- To allow/encourage teaching in depth and higher level thinking skills, to permit more (or less time) for students to attain high levels of mastery on state accountability tests, and
- To reduce stress, for both students and teachers, yet still offer a broad and rigorous curriculum.

What mistakes have some schools made when implementing block schedules?

- The use of a flawed decision-making process to adopt a block schedule.
- Poor preparation for teaching in the block, including insufficient staff development and/or inattention to course pacing.
- Unclear goals, over-promising or not meeting promises made.
- Poor scheduling decisions in the adoption phase.
- Budgetary concerns.
- The lack of a rigorous formal evaluation.

6 A/B Schedule

	A Day	B Day
Block 1	Class 1	Class 2
Block 2	Class 3	Class 4
Block 3	Class 5	Class 6

- Time per course-119 x 90
- Choices available-6
- Cost Factor- 5/6 (83%)
- Student Load-6
- Teacher Load-5
- Percentage Core: 67%
- Meeting format: E-O-D-yearlong

6-A/B Advantages

- Total time per course-More than all other schedules listed.
- Percentage of core-67% is more than all others and equivalent to the 6-period.
- Cost- Same as 6 period; more than 6/7 or 7/8; less than all others.

7 A/B Schedule (Atlee High School)

	M	T	W	R	F
Block 1 (100)	1	2	1	2	1
					2
Block 2 (100)	3	4	3	4	3
					4
Block 3 (82)	5 and Lunch	5 and Lunch	5 and Lunch	5 and Lunch	5 and Lunch
Block 4 (100)	7	6	7	6	6
					7

- Time per course- 100 x 90 or 50 X 180
- Choices available-7
- Cost Factor- 5/7 (71%), 6/7 (86%)
- Student Load-7
- Teacher Load-5 or 6
- Percentage Core: 57%
- Meeting format: E-O-D yearlong or daily-yearlong

7- A/B Advantages

- Total time per course (less than 6-period and 6 A/B; more than 7-Period, 8-period, 8 A/B, 4X4, and Hybrid 4X4)
- Percentage of core (same as 7-period, less than 6-period and 6 A/B; more than 8-period, 8 A/B, 4X4, and Hybrid 4X4)
- Choice (one more than 6-period; one less than 8-period, 8 A/B, 4X4, and Hybrid 4X4)
- Daily student load
- Daily teacher load

8 A/B Schedule

	A Day	B Day
Block 1	Class 1	Class 2
Block 2	Class 3	Class 4
Block 3	Class 5	Class 6
Block 4	Class 7	Class 8

- Time per course-88 x 90
- Choices available-8
- Cost Factor- 5/8 (62.5%), 6/8 (75%), 7/8 (87.5%)
- Student Load-8
- Teacher Load-5, 6, or 7
- Percentage Core: 50%
- Meeting format: E-O-D-yearlong

8- A/B Advantages

- Choice (Same as 8 A/B, 4X4, and Modified 4X4; more than all others.)
- Flexibility for double-dosing
- Daily teacher load (if teaching 5 or 6)
- Daily student load

Benefits of the Alternate day Block Schedule

- Longer classes encourage teaching with a variety of instructional models.
- Fewer “start-ups” and “endings” result in more useable instructional time.
- Fewer class changes improve school climate, discipline, and cleanliness.
- Because teachers see fewer students daily they know students better and are able to give more individual assistance.
- Compared to every day models, students have fewer classes, quizzes, tests, and homework assignments on any one day.

Issues to Be Addressed in the Alternate Day Block Schedule

- Attention Span
- Teacher planning
- Lunch periods
- Absences
- Review
- “Sink time”
- To float or not to float
- Equalizing students’ load
- Block vs. single period in 7 course plans
- Teaching in the Block

4 X 4 Schedule

	Sem. 1	Sem. 2
Block 1	Class 1	Class 2
Block 2	Class 3	Class 4
Block 3	Class 5	Class 6
Block 4	Class 7	Class 8

- Time per course-88 x 90
- Choices available-8
- Cost Factor- 5/8 (62.5%), 6/8 (75%), 7/8 (87.5%)
- Student Load-8
- Teacher Load-5, 6, or 7
- Percentage Core: 50%
- Meeting format: Daily-semester

4X4 Advantages

- Choice (Same as 8 A/B, 4X4, and Modified 4X4; more than all others.)
- Flexibility for double-dosing
- Daily and semester teacher load
- Daily and semester student load
- Acceleration and credit recovery possibilities

Adaptations Needed for the 4X4

- Performing Arts
- AP or IB
- Special Education
- Foreign Language

Summary of the Scheduling Trends in Virginia High Schools
1994-2006

Single Period Schedule Trends

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-2003	2003-2004	2004-2005	2005-2006
6 period	55	52	42	35	24	12	9	6	7	8	8	6
7 period	133	104	79	72	69	74	70	66	64	66	66	60
8 period	3	0	0	0	0	0	0	0	0	0	0	0
Total	191	156	121	107	93	86	79	72	71	74	74	66

Block Scheduling Trends

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-2003	2003-2004	2004-2005	2005-2006
6 A/B	16	13	12	14	7	5	6	6	7	7	0	0
7 A/B	39	52	69	74	86	82	90	92	89	89	94	89
8 A/B	10	6	8	10	11	22	27	31	34	38	42	58
4 x 4	28	58	78	84	93	97	94	95	100	97	93	95
Other	4	5	4	5	5	6	6	6	2	3	3	3
Total	97	134	171	187	202	212	223	230	232	234	232	245

"We should strive for a school schedule that is flexible enough to provide more learning time for students who need it and more choices for those who don't need more learning time.

The 4 X 4 Schedule
(Music Variation 1)

	Semester I	Semester II
Block I	1	2
Block II	3	4
Block III	5	6
Block IV	Marching Band	Concert Band

The 4 X 4 Schedule
(Music Variation 2)

<table>
<tr><th></th><th colspan="2">Semester I</th><th>Semester II</th></tr>
<tr><td rowspan="2">Block I</td><td rowspan="2">9 Weeks Marching Band</td><td colspan="2">27 Weeks Concert Band</td></tr>
<tr><td colspan="2">27 Weeks elective: Jazz, computer, jour., etc</td></tr>
<tr><td>Block II</td><td colspan="2">3</td><td>4</td></tr>
<tr><td>Block III</td><td colspan="2">5</td><td>6</td></tr>
<tr><td>Block IV</td><td colspan="2">7</td><td>8</td></tr>
</table>

The 4 X 4 Schedule
(Music Variation 3)

	Semester I	Semester II
Block I	1	2
Block II	3	4
Block III	5	6
Block IV	**Day 1: Band, Choir, Journ., PE/H, etc.**	
	Day 2: Orchestra, Jazz Band, Chorale, comp., PE/H, etc.	

The 4 X 4 Schedule
(Music Variation 4)

	Semester I		Semester II	
Block I	1		2	
Block II	3		4	
Block III	5		6	
Block IV	**Day 1: Band or Orchestra.**			
	Day 1 Lessons	**Day 1 PE/H**	**Day 2 Lessons**	**Day 1 PE/H**

AP Options

- One semester-one credit
- Two semesters AP-two credits
- One semester Pre-requisite; one semester AP-two credits
- A/B AP courses-one credit
- 3-9 Weeks AP+ 1 9-Week Elective

The 4 X 4 Schedule
(AP Variations)

<table>
<tr><th></th><th>Semester I</th><th>Semester II</th></tr>
<tr><td rowspan="2">Var.1</td><td colspan="2">45 minutes: AP English</td></tr>
<tr><td colspan="2">45 minutes: AP Government and Economics</td></tr>
<tr><td>Var. 2</td><td>27 Weeks AP</td><td>9 Weeks Elective</td></tr>
<tr><td rowspan="2">Var. 3</td><td colspan="2">Day 1: AP Gov’t & Econ or CP Gov’t & Econ.</td></tr>
<tr><td colspan="2">Day 2: AP English or CP English 12.</td></tr>
<tr><td>Var. 4</td><td>9 Weeks Elective</td><td>27 Weeks AP</td></tr>
<tr><td>Var. 5</td><td>Semester 1 Prerequisite</td><td>Semester 2 AP Course</td></tr>
</table>

The 4 X 4 Schedule
(Special Ed. Variation 1)

	Semester I	Semester II
Block I	Required Course 1	Required Course 2
Block II	Required Course 3	Required Course 4
Block III	Elective Course 1	Elective Course 2
Block IV	Resource Support Class	

The 4 X 4 Schedule
(Special Ed. Variation 2)

	Semester I	Semester II
Block I	Required Course 1	Required Course 2
Block II	Required Course 3	Required Course 4
Block III	Elective Course 1	Elective Course 2
Block IV	Resource Support Class & Required Course 5 (i.e. SPED English	

The 4 X 4 Schedule
(Foreign Language Sequencing A)

	Semester I	Semester II
Year 1	Spanish 1	Spanish 2
Year 2	Spanish 3	Spanish 4
Year 3	Spanish 5	AP Spanish
Year 4	Other Language	

The 4 X 4 Schedule
(Foreign Language Sequencing B)

	Semester I	Semester II
Year 1	Spanish 1	Spanish 2
Year 2	Spanish 3 Either Semester	
Year 3	Spanish 4 Either Semester	
Year 4	Spanish 5	AP Spanish

The Hybrid 4 X 4 Schedule with a Limited Number of Yearlong Embedded A/B Classes or "Skinnies"

	Semester I	Semester II
Block I	1	2
Block II	Day 1 Course 3	Day 2 Course 4
Block III	5	6
Block IV	**Course 7 Everyday Yearlong "Skinny"**	
	Course 8 Everyday Yearlong "Skinny"	

Hybrid 4X4 Advantages

- Choice (Same as 8-Period, 8 A/B, 4X4; more than all others.)
- Flexibility for double-dosing
- Daily and semester teacher load
- Daily and semester student load
- Mitigates testing and continuity concerns related to the 4X4 for certain courses

5 Block Trimester Schedule

	60 Days	60 Days	60 Days
Block 1	Class 1 .5 CR	Class 6 .5 CR	Class 11 .5 CR
Block 2	Class 2 .5 CR	Class 7 .5 CR	Class 12 .5 CR
Block 3	Class 3 .5 CR	Class 8 .5 CR	Class 13 .5 CR
Block 4	Class 4 .5 CR.	Class 9 .5 CR.	Class 14 .5 CR.
Block 5	Class 5 .5 CR	Class 10 .5 CR	Class 15 .5 CR

- Time per course-69 x 120
- Choices available-7.5
- Cost Factor- 4/5 (80%)
- Student Load-5
- Teacher Load-4
- Percentage Core: 4/7.5 (53%)
- Meeting format: Daily-trimester

5-Block Advantages

- Choice (7.5)
- Flexibility for 1.5 credit classes
- Daily and trimester teacher load
- Daily and trimester student load
- More days of contact than 4X4

5-Block Adaptations Needed

- Performing Arts
- AP or IB
- Special Education

Time Comparison Chart

	6 Period	7 Period	8 Period	6 A/B	7 A/B	5 Block Trimester	8 A/B, 4X4, Hybrid
Homeroom	13	14	11	13	15	15	13
Passing Time	35	40	45	20	25	30	25
Lunch	30	30	30	30	30	30	30
Class Length	57	48	43	119	3 X 100 and 1X 50	69	88
Total	420	420	420	420	420	420	420
Time Per Course	10,260	8,640	7,740	10,710	9,000	8280	7920
Choices	6	7	8	6	7	7.5	8
Class Meetings per Year	180	180	180	90	90 or 180	120	90
Percentage Core (E,M,SC,SS)	5/6 (67%)	4/7 (57%)	4/8 (50%)	5/6 (67%)	4/7 (57%)	4/7.5 (53%)	4/8 (50%)

All computations based on a 7 hour (420 minutes) student day.

Cost Comparison Chart

	8-Period, 8 A/B, 4X4, or Hybrid; Teach 7	7 Period or 7 A/B; Teach 6	6-Period or 6 A/B; Teach 5	5 Block Trimester; Teach 4	8-Period, 8 A/B, 4X4, or Hybrid; Teach 6	7-Period or 7 A/B; Teach 5	8 A/B, 4X4, Hybrid; Teach 5
Student Load	**8**	**7**	**6**	**5**	**8**	**7**	**8**
Teacher Load	**7**	**6**	**5**	**4**	**6**	**5**	**5**
Cost Factor	**87.5%**	**86%**	**83%**	**80%**	**75%**	**71%**	**62.5%**

Less Expensive

More Expensive

Evaluating the "Infrastructure" of the Scheduling Process at Your School

- Curriculum Change Processes-
  - Course approval and removal
  - Production of course catalogue and registration forms
- Counseling Processes-
  - Student advisement
  - Course registration and schedule data collection
- Scheduling Processes-
  - Master schedule creation

I'll be more enthusiastic about encouraging thinking outside the box when there's evidence of any thinking going on inside it.

Author Unknown

The Line-Up

1.....5.....9

Fatally Flawed

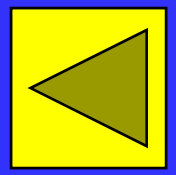
Average

Ideal

Issue: What is your evaluation of the effectiveness and efficiency of curriculum change, counseling, and master schedule creation processes in your school?

You're a "1" if you believe that scheduling "infrastructure" of your school is fatally flawed. Curriculum change processes are non-existent; no comprehensive course catalogue is created; registration forms are rarely revised; students do not complete four-year plans; no counseling calendar exists; students do not receive individual counseling related to course registration; course registration data is incomplete and is not collected in a timely fashion; master schedule creation focuses on survival; there is a mad scramble to complete the basic master schedule just before the beginning of school and significant numbers of students do not have schedules on the first day; student schedule change processes are unknown, random, and often inconsistent.

You're a "5" if believe your scheduling "infrastructure" is average.



You're a "9" if you believe that scheduling "infrastructure" of your school is ideal. Curriculum change processes run smoothly; all students complete four-year and annual plans with counselor, teacher, parent, and student input; schedule data collection is timely and efficient; master schedule creation focuses on meeting the needs of all students with input from department chairs and others as waranted; the basic master schedule is completed by the end of the school year; all students receive schedules no later than two weeks prior to the beginning of school; student schedule change policies are clear, fair, and efficient.

Take a moment and brainstorm possible action plan goals relative to the effectiveness and efficiency of your school's scheduling "infrastructure."

Research Summary

Canady and Rettig, 2000

I. **Almost Guarantees From A/B, 4/4, or Trimester Block Schedules**

- The number of discipline referrals to the office is reduced.
- The number of class tardies is reduced.
- The school day becomes less stressful for both students and teachers.
- Over time and with quality staff development, teachers change teaching behaviors; there tends to be less lecture and more active student engagement during classes.

Research Summary con't.

- After at least two years of implementation 65-80 percent of teachers, students and parents state they prefer the block. In many schools with A/B and 4/4 schedules, the percentage of support is greater than 90%.
- Both teacher and student attendance is likely to improve slightly.
- There will be an increase in the use of media center materials.
- There will be an increase in the use of technology that is available in the school.

Research Summary con't.

II. Academic Results (Softer data)

- The number of students on the "A, B Honor Roll" will increase.
- The overall GPA for the school will increase. Note: Initially, the number of "F's" in 4/4 schools may increase.
- If coming out of a six or seven period schedule, students will complete more classes. For a selected group of students this seems to lead to completion of additional math classes and higher levels of other classes. Students also have opportunities for traditional classes in vocational areas and in the performing arts.
- Student failure rates will decline (4/4).

Research Summary con't.

- Graduation rates will increase.
- The overall drop-out rate will decrease.
- There is evidence that special education resource students benefit from being assigned fewer classes at one time (Fairfax).
- Schools gain greater flexibility in helping students who need to be accelerated and students who need extended learning time (more in 4/4).
- There is no consistent evidence that just changing the schedule will either increase or decrease performance on standardized tests.

Zepeda and Mayers, 2006

- 58 Studies
- Higher GPA
- Improved School Climate
- Inconsistent Results on Standardized Tests and Attendance
- Teachers Like
- Teachers Change in Practice Inconsistent
- Need Staff Development

SREB HSTW Study 2002

- More progress was made when a flexible schedule was adopted allowing up to 32 credits rather than 24.
- Mathematics departments with the flexibility to reschedule failing students into re-teach classes every quarter saw math scores rise and failure rates decline.
- Many principals can show that the adoption of a more flexible schedule contributed to improved student achievement, fewer course failures, and fewer dropouts when graduation requirements rise and instruction changes to make good use of the additional focused teaching and learning time.
- Schools in the HSTW network that made the greatest gains in reading, math, and science achievement had adopted a 4X4 schedule and required students to complete 4 years of math and science and 24 or more credits for graduation.

(Bottoms, 2002)

Reasons Dropouts Give for Their Decision to Leave School

- Classes not interesting (47%)
- Not motivated or inspired to work hard (69%)
- Missed too many days and could not catch up (43%)
- Spent time with people who weren't interested in school (42%)
- Too much freedom and not enough rules in my life (38%)
- Personal reasons
  - **Get a job (32%)**
  - **Became a parent (26%)**
  - **Care for family member (22%)**
- Failing School (35%)

Source: The Silent Epidemic: Perspectives of High School Dropouts (2006).

And….

- 70% felt confident they could have graduated if they tried.
- 59%-65% of students missed class often the year before dropping out.
- 65% said there was a school staff member who cared about their success.
- 56% had a staff member they could go to for school problems
- 41% had a staff member they could go to for personal problems.

Source: The Silent Epidemic: Perspectives of High School Dropouts (2006).

Report Recommendations

- **Improve teaching and curricula to make school more relevant and engaging and enhance the connection between school and work,**
- **Improve instruction and access to supports for struggling students**
- **Build a school climate that fosters academics**
- **Ensure that students have a strong relationship with at least one adult in the school**
- **Improve the communication between parents and schools**

Source: The Silent Epidemic: Perspectives of High School Dropouts (2006).

Four Steps to High School Greatness

- Set High Expectations for All Students
- Give Students More Time to Learn
- Measure Each Student with a High and Incorruptible Standard
- Create a Team Spirit

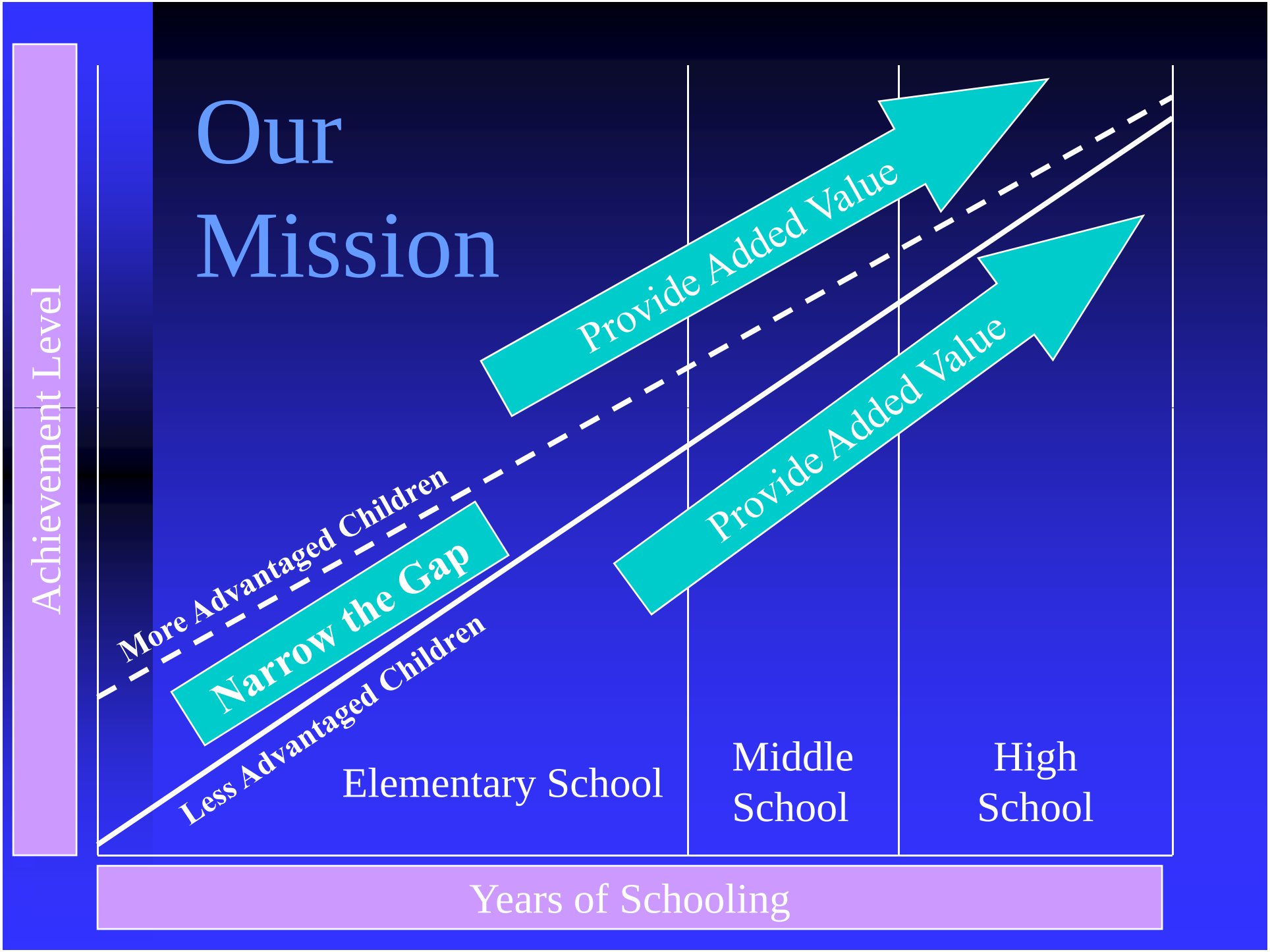
Source: Jay Matthews, Washington Post (May 2, 2006).

School Factors Related to Improving Student Achievement

- Balance the workload of students.
- Balance the workload of teachers.
- Provide extended learning time.
- Provide time in the master schedule for tutorials.
- Create a small group, caring learning environment
- Alter policies and grading practices that focus on "sorting and selecting" vs. "teaching and learning."
- Increase the amount of time students are actively engaged in their learning.

What do Effective High Schools Do?

- Set high expectations for all students.
- Encourage more students to take rigorous programs (pre-AP, pre-IB, School-to-Work, dual enrollment, AP, IB).
- Create structures and supports to help students who have not traditionally been enrolled in these more rigorous curricula to be successful.
- Personalize the high school environment.


Our Mission
Achievement Level
Provide Added Value
Provide Added Value
More Advantaged Children
Narrow the Gap
Less Advantaged Children
Elementary School
Middle School
High School
Years of Schooling

Sufficient Pipeline

- Are their enough students in pre-requisite or preparatory courses in lower grade levels to yield the numbers of AP course-takers desired?

Sufficient Pipeline Example: AP Calculus

8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Algebra I Section 1 (25)	Honors Geometry Section 1 (25)	Honors Algebra II Section 1 (25)	Math Analysis Section 1 (18)	AP Calculus (???)
Algebra I Section 2 (25)	Honors Geometry Section 2 (25)	Honors Algebra II Section 1 (25)	Math Analysis Section 2 (17)	
Algebra I Section 3 (25)	Honors Geometry Section 3 (25)			
Algebra I Section 4 (25)				
Total Students 100	Total Students 75	Total Students 50	Total Students 35	Total Students ???

AP Pipeline Worksheet (Sample)

Advanced Placement Goal Course: _____AP Calculus (AB or BC)_____

	8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
Course Title, # Sections, Total Enrollment	Algebra I, 4 Sections 100	H. Geometry, 3 Sections 75	H. Algebra II, 2 Sections 50	Math Analysis, 2 Sections, 35	AP Calculus (AB), 1 Section, 25
	Geometry, 1 Section 25	H. Algebra II, 1 Section 25	Math Analysis, 1 Section 25	AP Calculus (AB), 1 Section, 25	AP Calculus (BC), 1 Section, 25
Total in Pipeline	125	100	75	60	50
Percentage Yield		100/125=80%	75/100=75%	60/75=80%	50/60=83%

Pipeline Analysis and Goal Setting

- Complete a “Pipeline Worksheet” for each AP Course for which you hope to increase enrollment.
- Set an enrollment goal for that course.
- Using a second worksheet for each course, backwards map the courses, numbers of sections, numbers of students, and yields necessary to achieve this goal.

Increasing Honors Participation to Expand the Pipeline

- All 9th grade students are taught the "Honors English" curriculum.
- To earn Honors/weighted credit students must complete the "Honors Contract."
- Students may still earn regular credit if "Honors Contract" is not fulfilled.
- Grading Scale: A,B,C or I.
- Support courses are provided for weaker students.

7-Period Day with Intervention/Enrichment Period

Period 1
Period 2
Period 3
Intervention/Enrichment 30-45 Minutes
Period 4
Period 5
Period 6
Period 7

The 8 A/B Schedule with Intervention/Enrichment Block

	Day 1	Day 2
Block I	1	2
Block II	3	4
Block III	5	6
Block IV	7	Intervention/ Enrichment

The 8 A/B or 4X4 Schedule with a 9th Period Added for Intervention/Enrichment

	Sem. 1 or Day 1	Sem. 2 or Day 2
9th Period	Intervention/Enrichment	
Block I	Course 1	Course 2
Block II	Course 2	Course 4
Block III	Course 3	Course 6
Block IV	Course 4	Course 8

The Intervention/Enrichment Period

GARNET VALLEY HIGH SCHOOL
Bell Schedule
2008-2009

PERIOD 1	**7:30 - 8:50**	**80 minutes**
class change		**5** minutes
PERIOD 2	**8:55 – 10:18**	**83 minutes**
class change		5 minutes
ENHANCEMENT	**10:23 – 11:08**	**45 minutes**
class change		**5** minutes
LUNCH 1 **11:13 – 11:43** *30 minutes*	**PERIOD 3** **11:13 – 11:53** *40 minutes*	**PERIOD 3** **11:13 – 12:34** *81 minutes*
PERIOD 3 **11:46 – 1:07** **81** *minutes*	**LUNCH 2** **11:55 – 12:25** *30 minutes*	
	PERIOD 3 **12:26 – 1:07** *40 minutes*	**LUNCH 3** **12:37 – 1:07** *30 minutes*
		114 minutes TOTAL
class change		**5** minutes
PERIOD 4	**1:12- 2:32**	**80 minutes**

Key Factors: I/E

- Scheduling the Intervention/Enrichment period is easy compared to organizing and preparing for instruction within it.
- All students and staff must be productively engaged during the period.
- A decision must be made as to what role students' choice plays in the I/E period.
- A computer management program with capability of tracking students' I/E choice/assignment and attendance is necessary.
- Clear, consistent, and involved leadership is required to ensure that assessment, data analysis, tiering, planning intervention and enrichment instruction, and progress monitoring all are carried through.
- Time must be allocated for planning for groupings and instructional activities.

Key Factors: I/E con't.

- It may be wise to select specific programs for enrichment and/or intervention activities rather than have teachers design their own.
- An Response to Intervention (RTI) type tier structure based upon this assessment is necessary to allocate students to enrichment, moderate intervention and intensive intervention groups.
- A decision must be made as to whether or not special services (i.e. special education or ESOL) will be "the" intervention for some qualifying students during the I/E time or will they be served at a different time by those professionals.
- While some school-wide, grade level, or team activities (assemblies, pep rallies, school pictures, guidance meetings, course registration, seminars, etc.), may use some of this period, the primary purpose is for Intervention/Enrichment must be extended learning time, re-teaching, re-testing, tutoring, etc.

Short Inter-sessions for Intervention/Enrichment

37 Days	3 Days	37 Days	3 Days	37 Days	3 Days	37 Days	20 Days
Paced Instruction	Intervention/ Enrichment Assessment	**Paced Instruction**	Intervention/ Enrichment Assessment	**Paced Instruction**	Intervention/ Enrichment Assessment	**Paced Instruction**	Post-Exam Enrichment Unit Assessment

7-Period Day Double Dose

Per. 1AP Chem
Per. 2 AP Chem
Period 3
Period 4
Period 5
Period 6
Period 7

Double Dose

	Day 1/Sem.1	Day 2/Sem. 2
Block I	English	Science
Block II	AP Calculus	AP Calculus
Block III	Social Studies	PE/H
Block IV	Elective	Elective

Parallel Double Dose

	Day 1/Sem.1	Day 2/Sem. 2
Block I	English	Science
Block II	AP Statistics	Computer Class
Block III	Social Studies	PE/H
Block IV	Elective	Elective

Two Double Doses

	Day 1/Sem.1	Day 2/Sem. 2
Block I	AP English	AP English
Block II	AP Calculus	AP Calculus
Block III	Social Studies	PE/H
Block IV	Elective	Science

Double-Duty Double Dose

	Day 1/Sem.1	Day 2/Sem. 2
Block I	English	Science
Block II	AP W. History	AP W. History/AVID
Block III	Social Studies	PE/H
Block IV	Elective	Elective

Key Aspects of Double Dosing

- Adding more instructional time requires a revision of the course pacing guide; how is the additional time going to be utilized effectively?
- Not all students enrolled in an AP course require additional time to learn; when is double dosing justified for all?
- Double dosing eats up FTEs in the department utilizing the practice increasing class size in other departmental sections or requiring additional departmental staffing.
- Double dosing eats up electives in students' schedules; this is especially problematic in 6 and 7 course schedules or when multiple courses are double-dosed in any schedule.

Key Aspects of Double Dosing, con't.

- Instructors often favor double-dosing for AP courses because it provides an edge over the competition, it reduces the number of groups and preps for the teacher, and it increases the time the instructor spends with "better" students. Consequently, the "default" format for all courses (including AP courses) should be the standard format: one period per day or an every-other-day block. (Please note while the standard format for the 4X4 is a block class that meets daily for one semester, we do not recommend this for AP courses because of the May testing timetable. Most schools that operate a 4X4 schedule, hybridize it for AP courses by embedding an A/B schedule into the master for a limited set of courses.)

7-Period Day Support Course

Per. 1AP A/B Calc.	
P1. D1 **AP Support**	**P1. D2** **PE or .5 Elec.**
Period 3	
Period 4	
Period 5	
Period 6	
Period 7	

The 8 A/B Schedule: AP Support

	Day 1	Day 2
Block I	U.S. History A.P.	A.P. Support or Elective
Block II	English 12	Spanish IV
Block III	Math Analysis	Physics
Block IV	Elective	Elective

The 8 A/B Schedule: AP Support

	Day 1	Day 2
Block I	A.P. World	A.P. Support or Elective
Block II	English 10	AVID
Block III	Math Analysis	Physics
Block IV	Elective	Elective

The 4X4 Schedule: Algebra I A/B Support

	Day 1	Day 2
Block I	Day 1: Algebra I	Day 2: Algebra 1 Support or Elective
Block II	English 9	Spanish I
Block III	Earth Science	World Hist.
Block IV	Elective	Elective

The 8 A/B Schedule: Algebra 1 Support

	Day 1	Day 2
Block I	Geometry 1	Geometry Support or Elective
Block II	English 9	Spanish I
Block III	Earth Science	World Hist.
Block IV	Elective	Elective

Critical Issues Regarding AP Support Classes

- AP support classes may be course specific or more generic departmental supports serving multiple AP courses.
- Is an AP support course elective for all or mandatory for some?
- If it is mandatory for some, criteria must be established to determine who must enroll.

Critical Issues Regarding AP Support Classes, con't.

- If AP support is elective, care must be taken to ensure that instructors do not make the support course a "required" elective, thereby creating a double dose.
- Support courses must be assigned legitimate state-approved course codes so that students may earn credit.
- Students enrolled in support courses must not be penalized by limiting their grade in the AP course, because "It's not fair that they have more time."

Question???

- Under what conditions would it be preferable to double dose the whole group creating an identifiable cohort that bonds together versus differentiating between “Tier 1” students who don’t need AP support and “Tier 2” students, who do need support?

Scheduling a Summer or Pre-AP Critical Skills Class (or sooner or bigger)

- 4-6 weeks in summer or the semester before attempting social science, English or science AP courses
- Content to include critical reading and writing skills related to the following:
  - Cause and effect
  - Deductive reasoning
  - Inductive reasoning

Double Blocks of LA and Math with Tutorials: Student Schedule

<table>
<tr><th></th><th>Day 1</th><th>Day 2</th></tr>
<tr><td>Block I</td><td colspan="2">Language Arts and Reading</td></tr>
<tr><td>Block II</td><td colspan="2">Algebra I</td></tr>
<tr><td rowspan="2">Block III</td><td rowspan="2">Social Studies</td><td>LA Tutorial 45m</td></tr>
<tr><td>Math Tutorial 45m</td></tr>
<tr><td>Block IV</td><td>PE/H</td><td>Elective or Earth Science</td></tr>
</table>

Re-cycling in Mathematics

	Sem.1	Sem. 2
Block I	LA	Science
Block II	Algebra I-P1	Algebra I-P1 or P2
Block III	Social Studies	PE/H
Block IV	Elective	Elective

Recovery Model (Sem. 1)

(Possibly for Grade 8 Failures)

	Semester 1			Semester 2
	30 Days	30 Days	30 Days	Potential Re-entry
Block I	C1	C2	C3	Course 5
Block II	C1	C2	C3	Course 6
Block III	C1	C2	C3	Course 7
Block IV	C4-Elective			C8-Elective

Recovery Model (Sem. 2)

(For 1st Semester Failures)

	Semester 1	Semester 2		
		30 Days	30 Days	30 Days
Block I	Req. Course 1	C5 (1)	C6(2)	C7
Block II	Req. Course 2	C5 (1)	C6(2)	C7
Block III	Req. Course 3	C5(1)	C6(2)	C7
Block IV	Elective Course 4	Elective Course 8		

Achieving Common Goals

- Common Curriculum
- Common Pacing
- Common Formative and Summative Assessments
- Collaborative Monitoring System
- Common Time for Intervention and Enrichment

Progressive Algebra

Rettig and Canady, 1998.

T's	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
MA	A1	A2	A3	A4	G1	G2	G3	G4
MB	A1	A2	A3	A4	G1	G2	G3	G3
MC	A1	A2	A3	A3	A4	G1	G2	G2
MD	A1	A2	A2	A3	A4	A4	G1	G1
ME	A1	A1	A2	A2	A3	A4	A4	G1
MF	A1	A1	A2	A2	A3	A3	A4	A4

Key: Q=4.5 weeks; A=Algebra I, 4 Parts; G=Geometry 4 Parts

- "If an educator keeps using the same strategies over and over and the student keeps failing,

who really is the slow learner?"

Staff Development and Preparation

- Schedule Creation and Modification
  - Program of studies
  - Scheduling calendar
- Revision (or creation of) Pacing Guides
- Teaching in the Block
- Policy Changes

Staff Development Planning

I. **Subject-Specific Issues: "Surviving and Thriving in a Block Schedule"**

8:30-9:30	**Panel "General Instructional Issues"**
9:30-9:45	**Break**
9:45-11:45	**Subject Area Breakouts**
	Topics: Planning, pacing, classroom organization, time use, instructional strategies and assessment.
11:45-1:00	**Lunch**
1:00-2:30	**Subject Area Breakouts**
	Topic: Sample Lesson
2:30-2:45	**Break**
2:45-3:30	**Panel "Q and A"**

II. Instructional Strategies

A. **Cooperative Learning (Minimum 2 days)**

B. **Socratic Seminars (2 days)**
(Humanities Teachers)

C. **Technology (2 days)**
Math/Science/Tech/ Teachers

D. **Models of Teaching (1-2 days)**

III. Pacing Guides and Lesson Design (2 days in departments)

IV. On-going Staff Development

- **A. Collaborative sharing by and/or across departments scheduled on a regular basis.**
- **B. District-wide sessions by departments to share what works.**
- **C. Additional staff development sessions**

When I die,

I hope it’s during a lecture;

the difference between

life and death will be so small,

that I won’t notice it!

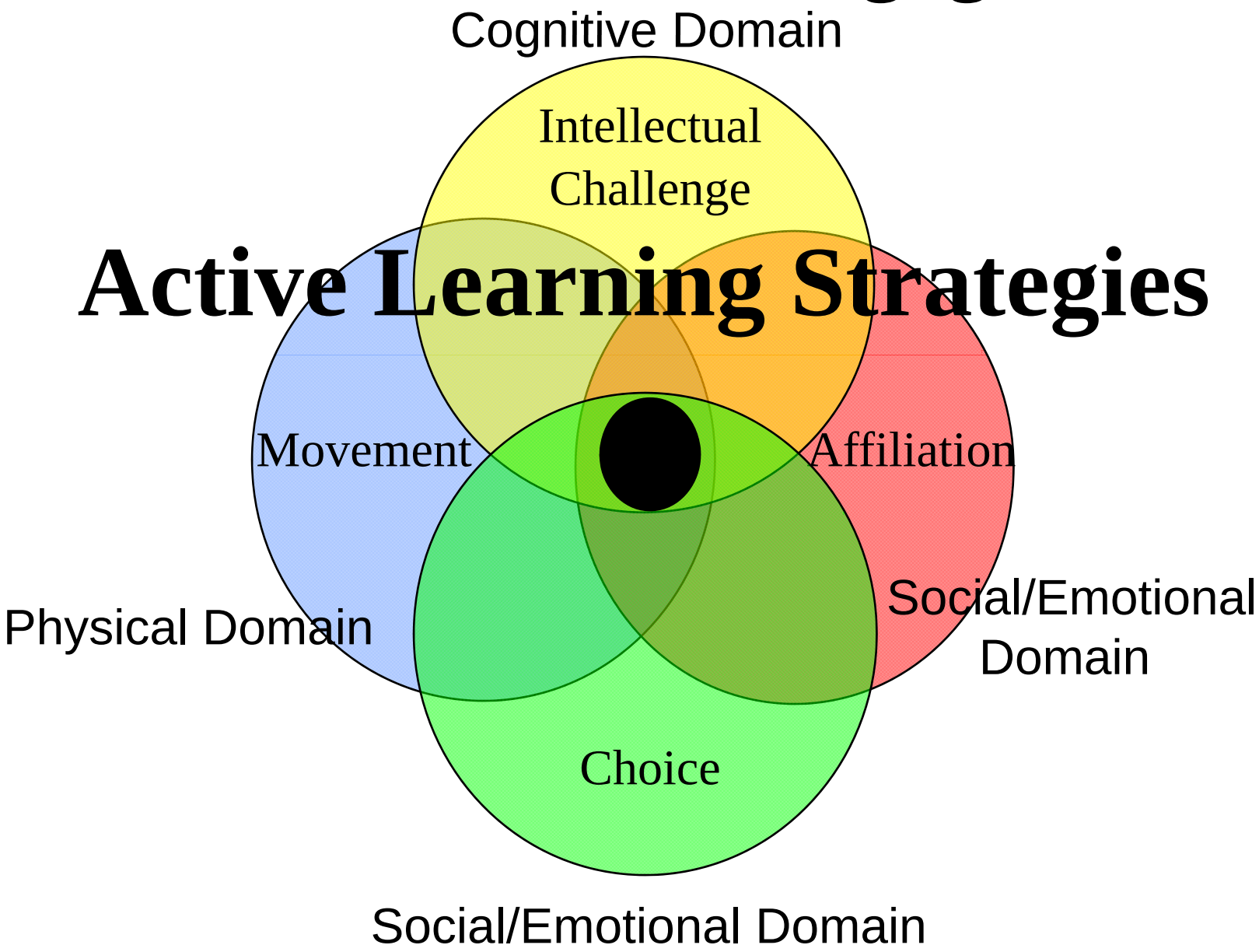
(Anonymous Student)

Teaching in a block schedule
is like eternity,

and eternity is spent
in one of two places.

John Strebe

The Four Circles of Engagement



Three-Part Lesson-Design

1. Explanation (20-25 mins.)
   - **Objective**
   - **Plan for the Day**
   - **Connections to Previous Learning**
   - **Homework Review**
   - **Teach New Material**
2. Application (40-45 mins.)
3. Synthesis (15-20 mins.)
   - **Assessment**
   - **Re-teaching**
   - **Establish Connections and Relevance**
   - **Closure**

Application Phase

I. Cooperative Learning
II. Paideia Seminars
III. Laboratory
IV. Simulation
V. Models of Teaching
    A. Concept Development
    B. Inquiry
    C. Concept Attainment
    D. Synectics
VI. Learning Centers or Stations
VII. Technology
VIII. Content Area Literacy Strategies

Research Regarding the General Effects of Engagement on Achievement

Synthesis Study	Number of Effect Sizes	Average Effect Size	Percentile Gain
Bloom, 1976	28	0.75	27
Frederick, 1980	20	0.82	29
Lysakowski & Wahlberg, 1982	22	0.88	31
Wahlberg, 1982	10	0.88	31

As Reported in Marzano, R. (2007). The art and science of teaching. Alexandria, VA: ASCD.

Stimuli for Student Engagement

- High Energy
- Missing Information
- Self
- Mild Pressure
- Mild Controversy and Competition

High Energy as Stimulus

- Movement
- Lesson Pacing (especially smooth transitions)
- Teacher Enthusiasm and Intensity

Missing Information as Stimulus

- Mysteries (Puzzles, riddles, etc.)
- Inquiry Lessons
- Directed Reading (or Listening) Thinking Activities (DRTA, DLTA)

Self as Stimulus

- Student Interests
- Student Choices
- Material Relevant to Current Existence

Mild Pressure as Stimulus

- Appropriate level of pressure
- Questioning techniques including “wait time” and individual response boards
- Intellectual Challenge

- Key: Pressure that is too intense or too long will cause stress that has a negative impact on learning and well-being.

Mild Controversy and Competition as Stimuli

- Games/Contests
- Seminars
- Discussions
- Debates
- Key: Controversy must not be too “controversial.” Competition must not be too intense. Losing teams and/or individuals must not feel devalued.

How to Fail When Implementing a New Schedule

I. Mess-up the Process

A. Don’t identify the goals.

B. Start with an administrative edict.

C. Let the study committee dominate.

D. Don’t involve the parents.

E. Don’t involve the students.

F. Don’t involve the central office.

G. Don’t involve the union.

How to Fail When Implementing a New Schedule con't.

H. Do an incomplete study.

1. Don't read and do research.
2. Don't visit other schools.
3. Don't do a mock master schedule.
4. Don't create sample teacher and student schedules.
5. Don't address benefits for both students and teachers.

How to Fail When Implementing a New Schedule con't.

II. Do Poor Planning

A. Don't create pacing guides.

B. Assume teachers will change instruction to fit the block without staff development assistance.

C. Don't change school policies to be in line with the new schedule.

How to Fail When Implementing a New Schedule con't.

III. Create a Poorly Constructed Schedule

- **A. Don't balance teams academically.**
- **B. Make sure you have unequal class times.**
- **C. Create short chunks of unusable time.**
- **D. Create split periods to run lunch.**
- **E. Make sure students can't take (fill in the blank) "because of the schedule."**

IV. Don't Continue to do Staff Development After the first year.

V. Don't Plan to Evaluate until Someone Asks for It.

References

- Ball, W. H. and Brewer, P. F. (2000). Socratic seminars in the block. Larchmont, NY. Eye On Education.
- Blaz, D. (1998). Teaching foreign languages in the block. Larchmont, NY: Eye on Education.
- Canady, R. L. & Rettig, M. D. (Eds.) (1996). Teaching in the block: Strategies for engaging active learners. Larchmont, NY: Eye On Education.
- Canady, R. L. & Rettig, M. D. (1995). Block scheduling: A catalyst for change in high school. Larchmont, NY: Eye on Education.
- Conti-D'Antonio, M., Bertrando, R. and Eisenberger, J. (1998). Supporting students with learning needs in the block. Larchmont, NY: Eye on Education.
- Gilkey, S. N. and Hunt, C. H. (1998). Teaching mathematics in the block. Larchmont, NY: Eye on Education.
- Marzano, R. J. (2003). What works in schools: Translating research into action. Alexandria,VA: ASCD.

References con't.

- Pettus, A. and Blosser, M. (2001). Teaching science in the block. Larchmont, NY. Eye On Education.
- Rettig, M. D. (2006). Directory of high school scheduling models in Virginia. A report of the "Study of innovative high school scheduling in Virginia". Harrisonburg, VA: James Madison University, http://coe.jmu.edu/EdLeadership/index2.htm.
- Rettig, M. D. & Canady, R. L. (2000). Scheduling strategies for middle schools. Larchmont, NY: Eye On Education.
- Rettig, M. D. & Canady, R. L. (1998). High failure rates in required mathematics courses: Can a modified block schedule be part of the cure? NASSP Bulletin,82(596), 56-65.
- Rettig, M. D., McCullough, L. L., Santos, K.E., and Watson, C.R. (2004). From rigorous standards to student achievement: A practical process. Larchmont, NY: Eye on Education.
- Strzepek, J. E., Newton, J., and Walker, L. D. (2000). Teaching English in the block. Larchmont, NY: Eye On Education.
- Zepeda, S.J, & Mayers, R.S. (2006). An analysis of research on block scheduling. Review of Educational Research 76 (1), 137-170.