Elements of Highly Effective Mathematics Programs Article Discussion

Segment 1 – What Gets Taught

- Differences in spirals between the United States and Singapore reveal pros and cons of both systems
- Differences in state standards confuse the issue of what is being taught
- Mastery of subject matter for advancement
- Mathematics learning expectations vary across the states along several dimensions

- Standards vary widely across states and grade level expectations.
- As a result of curricula in the United States are a mile wide and an inch deep (publishers).
- Spiral effect may not be most effective
- Singapore's curriculum covers a relatively small number of topics with a balance between computational skills, conceptual skills, problems solving.
    - Mastery is required on the first go around.
- NCTM has revised its Curricular Focal Points (2006) with three for each grade level
- US framework has strengths in communications, applied math, probability and real world problems.
- Debate skills vs. inquiry

Segment 2 – How Math is Taught

- Instruction should build on existing knowledge (Teacher and student background)
- Skills and conceptual understanding are both important
- Age appropriate instruction teaching recognizes that students have different readiness
- Appropriate use of whole group, peer and individual assessments
- Using real life examples where possible
- Think about their own thinking – "meta-cognition" follow through in solving a problem

- Skills based vs. problem solving
    - Need a balance of <u>both</u>
    - Skills don't have to come first, must be integrated
- Sequenced and developmental program involves
    - Building on existing knowledge
    - Conceptual understanding and procedural fluency
    - Meta-cognition (How I do math)
- High Performing countries avoid reducing to mere procedural exercises
    - Not just the right answer without understanding how
    - More than one way to solve

Segment 3 – Good Teaching is Key

- Good math teaching uses a variety of approaches and teachers know <u>when</u> to use them (flexible grouping, etc)
- Identify problems/issues in a concept; maybe re-teach in a different manner
- Struggling students – <u>early intervention</u> best
- Involve parents and community for <u>all</u> students both remediation and enrichment

- Early ID and Interventions of struggling students
- Teacher has depth of content knowledge
- Teacher has awareness of developmental stages of math
- Effective instruction is essential
- Engagement of learning must occur. This includes:
    - Communication
    - Collaboration
    - Rigor of materials
- Teachers must use a variety of strategies
- Assessment is needed to guide instructional decisions

Segment 4 – Role of District and School Leaders

- Communicate a clear vision to all stakeholders
- Cultivate atmosphere of openness
- Consistency and continuum (K-12 continuity)
- Empower teachers
- Address and handle conflict and questions in an appropriate and positive way
- Solicit teachers input
- Provide staff development that meets the need of teachers

- Combination of strategies to affect success and change
- Adherence to the professional standards
- Professional development is key
- Value proposition for families is clear parents-as-partners
- School leaders do make a difference
- High standards
- Support systems are important