



A GUARANTEED AND VIABLE CURRICULUM: TAKING A CLOSER LOOK



CSCOPE promotes student achievement through a standards-based curriculum.

A GUARANTEED AND VIABLE CURRICULUM

In researching what works in schools, Robert Marzano (2003) found five school-level factors that promote student achievement. Using the process of statistical effect size analysis, Marzano concludes that a guaranteed and viable curriculum is the most powerful school-level factor in determining overall student achievement. A guaranteed and viable curriculum is defined as a combination of opportunity to learn and time to learn. Districts and schools must ensure that the intended curriculum (in Texas, the Texas Essential Knowledge and Skills (TEKS) and district curriculum) is implemented consistently by all teachers. In turn, the attained curriculum — what students actually learn — should align with the intended and implemented curricula. According to Marzano, students have the opportunity to learn when they study a curriculum that clearly articulates required standards and ensures that all teachers have adequate time to help students acquire and integrate required content. Opportunity to learn involves commitments from schools and districts to ensure that the written, taught, and learned curricula are aligned and that they are organized in such a way as to provide sufficient time for learning to occur. How can schools and districts make sure that this alignment occurs?

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VERTICAL ALIGNMENT DOCUMENTS

The CSCOPE Vertical Alignment Documents present clearly articulated and aligned standards among grade levels using the TEKS statements and student expectations. According to Marzano's framework, curriculum is guaranteed if states and districts give clear guidance to teachers regarding the content to be addressed in specific courses and at specific grade levels.

Marzano (2003) is a strong advocate of a conceptually-organized curriculum that is clearly articulated within periods of time or grade levels (horizontal design elements) and across grade levels (vertical design elements). He stresses that effective curriculum should emphasize key spiraling components. These components represent the major competencies, ideas, and skills that students are expected to revisit within and across grade levels with growing levels of competence, proficiency, and depth of understanding.

The CSCOPE development team, including Education Service Center personnel, and other content area experts have done extensive work adding specificity to the TEKS student expectations. With this added specificity, Texas educators who use CSCOPE are able to track the development and complexity of an objective, or group of similar objectives, as they progress across grade levels. CSCOPE ensures that each standard from the TEKS framework includes specificity for each student expectation so standards and instruction are truly aligned between grade levels.

To support implementation of this detailed curriculum, districts must have processes and personnel in place to ensure that there is sustained monitoring of the curriculum and its implementation and that individual teachers do not have the option to disregard or replace assigned content. This creates what Marzano refers to as unconditional delivery of the curriculum. Fenwick English (2006) points out that the only way to ensure educational equity among students is for there to be a *tight alignment* between the taught and the tested curriculum. Without alignment, student and community demographics will continue to be the most powerful predictors of student test results. English (2006) has reported several studies which found that historically the best scores come from the wealthiest areas of town and the lowest scores come from the poorest areas of the same town. (English (2006) refers to Edward L. Thorndike's finding that this trend has been noted in research since 1951.) The use of high-stakes tests on a statewide basis without alignment will follow the same fault lines. English also refers to a 1994 study which found that 89% of the variance in state average scores on the National Assessment of Educational Progress (NAEP) as accounted for by education of parents, number of parents at home, type of community, and poverty rate. While these are not factors controlled at a school level, schools can control the written and taught curricula. There can be no "slack" in the system between the written and taught curricula and the tested curriculum if students are to be successful. English and Steffy (2001) report that when there *is* curriculum alignment, that alignment accounts for 72% of the variance of achievement scores; student attendance, exposure to content, and quality of instructional delivery are also "significant predictors" of students' achievement test scores.

In establishing a curriculum continuum, vertical as well as horizontal alignment of student performance expectations is critical. The CSCOPE Vertical Alignment Documents present a tightly aligned curriculum that delineates student expectations with specificity. This ensures that the teacher understands exactly what is to be taught and can plan effective instruction.

High-stakes tests, such as the Texas Assessment of Knowledge and Skills (TAKS), measure complex learning acquired over years; in other words, tests such as TAKS assess the sum of all prior grade-level knowledge. CSCOPE is not a curriculum designed "to teach the test"; however, the Vertical Alignment Documents allow teachers to see the progression of the development of tested student expectations with specificity, so that they can understand how essential learning builds throughout a student's school experience.

Students and their parents have a right to expect that students will learn grade-level standards, and that teachers can communicate specifically about progress toward mastery of grade-level standards. Teachers have a responsibility to ensure that students meet grade-level standards, both for the sake of student learning and

because subsequent grade levels depend on student mastery of standards in previous grades.

Finally, the specificity of the CSCOPE Vertical Alignment Documents provide a common language and delineation of skills which allows building principals to meet their responsibility of ensuring that the curriculum is being implemented accurately and consistently in every classroom.

Another aspect of alignment indirectly addressed by the specificity of the CSCOPE Vertical Alignment Documents is alignment of district resources with the curriculum. English (2006) is very clear in describing the difference between a program and a curriculum. A program is not a curriculum, but if a program is picked to meet curriculum objectives, progress can be reliably assessed. Likewise, a textbook is not a curriculum. The specificity of CSCOPE Vertical Alignment Documents gives educators a tangible guide for selecting and reliably evaluating programs, textbooks, and instructional materials in terms of how effectively they meet curriculum objectives.

YEAR AT A GLANCE

The CSCOPE Year at a Glance is designed to present a snapshot of the entire year's instructional plan. The Year at a Glance is a map and pacing guide for units of study. It makes the curriculum viable by ensuring that the teacher has adequate instructional time to present the required content.

Marzano (2003) identifies the need for educators to provide a coherent and interesting organization for essential curriculum content, with a sequence that revisits enduring understandings, reinforces essential skills and procedures, and includes student interests to ensure ownership in content.

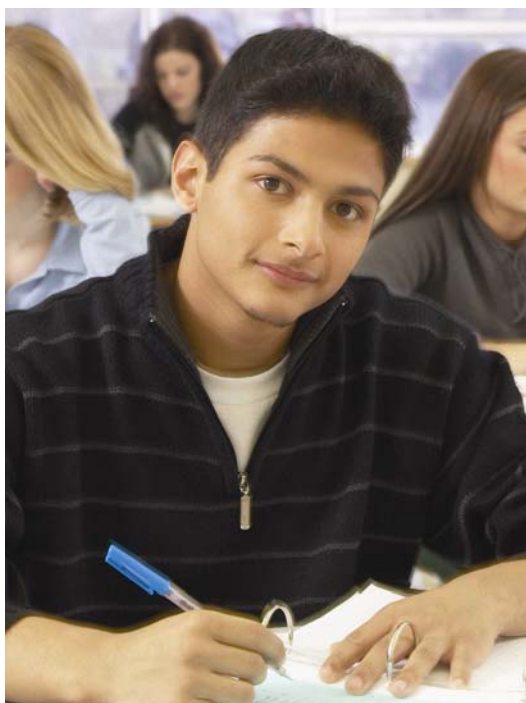
Curriculum mapping is a process for documenting the plan for curriculum delivery over a specified period of time. The current curriculum mapping model is based on the work of Heidi Hayes Jacobs (2004). To gain insight into gaps, absences, and repetitions in a school or district's K-12 curriculum, it is critical to create quality maps. The Year at a Glance, as a curriculum map, provides a springboard for teachers and administrators to focus discussion on a comparison between what is planned and what is really occurring in individual classrooms. This data is measured in real time, allowing for responsive instructional prioritization and pacing adjustments.

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One of the most important focuses of curriculum mapping is curricular dialogue. Jacobs (2004) states that teachers and administrators must consider "...the empty chair...which represents all students in a given school or district, and...all work must focus on Johnny, and all comments and questions are welcomed as long as they are in his best interest." (p. 2) Second, if it is in the students' best interest to change, modify, stop, start, or maintain curriculum practices, programs, and/or other related issues, there must be data-based proof to do so (Jacobs, 2002).

It is the intent of CSCAPE that districts be able to use the Vertical Alignment Documents, the Year at a Glance, and the Instructional Focus Documents to foster reflective practice and collegial, data-driven dialogue around curriculum.

INSTRUCTIONAL FOCUS DOCUMENTS



CSCOPE Instructional Focus Documents are used to group the specified standards from the Vertical Alignment Documents and the Year at a Glance into a logical sequence for instruction. The standards should not be taught in isolation; there are logical ways to bundle them to maximize student learning. These documents present the standards which are directly taught in each block of instruction, the academic language of instruction, key understandings, guiding questions, and possible student misconceptions as well as performance indicators to ensure that the standards are attained at the required level of rigor. A rationale is provided to explain why the standards are bundled in the specified groupings.

Marzano and others emphasize that many state and district curricula are overloaded with too many standards, forcing teachers to teach content for coverage of standards rather than teaching content for depth of understanding. Japanese teachers emphasize depth versus superficial coverage; they don't "cover" a variety of discrete skills. In fact, nations with higher test scores use teaching and learning strategies that promote understanding rather than "coverage" and rote learning (Tomlinson & McTighe, 2006). Marzano and Kendall (1998) studied 160 national and state-level content standards yielding a synthesis of 255 standards and 3,968 benchmarks that students are expected to do and know in various subject areas. If 30 minutes of instructional time was allocated to each identified benchmark, an additional 15,465 hours (about nine years) more of school would be required for students to learn

them all. With so many standards to teach and with every increasing accountability pressures, educators feel increasing pressure to focus only on tested standards to the detriment of the remainder of the curriculum. Heidi Hayes Jacobs has coined this problem a “curriculum ambush” (Perkins-Gough, 2003).

How, then, are teachers to offer the full curriculum to students at a rigorous level? The bundling of the TEKS in the CSCOPE Instructional Focus Document addresses this issue so that skills are not taught in isolation, are offered in rational and reasonable grouping, and are presented in a recursive manner so that skills are revisited, expanded, and applied in different contexts.

The organization of the Instructional Focus Documents presupposes a belief that the goal of education is to produce self-directed, self-aware students who are independent learners. The Instructional Focus Documents are organized around essential questions and concepts that are timeless; students explore specific facts, concepts, and skills within this context. Research shows that rich, significant curriculum aimed at meaning and understanding allows “low performers” to increase their grasp of advanced skills at least as much as their higher-achieving peers (Tomlinson & McTighe, 2006).

The big-idea questions signal that education is not just about coming up with “the answer” but about learning how to learn. The essential questions framed around the key concepts, inquiries, and structure of the specific content areas. They are framed in an open-ended format which allows all students to think and respond in some way; students may enter the curriculum at varying levels of understanding. Students will make sense of complex ideas by thinking deeply, weighing alternatives, justifying their thinking process, and making connections with prior learning and experiences. The questions are also designed to stimulate opportunities to transfer understandings to other contexts and content. (Wiggins (2007) cautions us not to confuse questions which are “essential to me in my role as a teacher” with questions which are “essential to anyone as a thinking person and inquiring student for making *meaning* of facts in this subject.” While both types of questions are important, the first relates to instruction, while the second relates to curriculum. The idea of essential questions is further elaborated by Wiggins, 2007.)

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The Instructional Focus Document uses these enduring understandings and essential questions as the foundation for the structure of each unit. Using the three-step *Understanding by Design* process described by Wiggins and McTighe (1998), the Instructional Focus Document (IFD) is further elaborated. The first two steps, identifying desired results and determining acceptable evidence of student understanding and learning, are addressed in the Instructional Focus Document. (The third step, planning learning experiences and instruction, is addressed in the exemplar lessons.)

Evidence of student understanding is revealed when students apply (transfer) knowledge in authentic contexts. The Instructional Focus Document Performance Indicators clearly define the content, authentic context, cognitive level, and standard of student performance required for students to demonstrate mastery of unit concepts and key understandings. The rigor of these Performance Indicators gives students and teachers challenging goals to achieve.

Challenging goals, pressure to achieve, and effective monitoring of student progress have both school and student level effects (Marzano, 2006). Academic achievement scores in classrooms in which clear learning goals are set is 21% higher than the achievement in classrooms in which they are not. A shared expectation of challenging academic goals increases the success of a school as a whole and contributes to the effectiveness and cohesion of the instructional team (Marzano, 2003).

There are two final components of the Instructional Focus Documents: a listing of potential student misunderstandings and a list of academic language of instruction. Students' incomplete understandings, false beliefs, and misconceptions may be barriers to their successful mastery on new and more complex ideas and content. If students' initial understanding is inaccurate, it is unlikely they will be successful with new concepts. (*How People Learn*, published by the National Academy Press offers an extensive explanation of this.)

All students need to develop fluent use of academic vocabulary. English and Steffy (2001) remind us that low income children rely especially heavily on schools to provide the cultural capital that is tested. Teachers must ensure that students have the academic vocabulary and conceptual schema to be successful with the curriculum; exposure is not enough.

All of the components of the Instructional Focus Document—the unit TEKS and rationale for how they are bundled, key understandings and guiding questions, rigorous performance indicators, and alerts to potential misconceptions—provide the teacher with all relevant information to establish what Heidi Hayes Jacobs calls “informed autonomy” (p. 62). The teacher, armed with an understanding of

organizing principles of his/her content area, understanding of vertical alignment, an Instructional Focus Document which organizes content, and knowledge of pedagogy is prepared to develop challenging and rigorous lessons based on tightly aligned standards.

SUMMARY OF CURRICULUM

The Vertical Alignment, Year at a Glance, and Instructional Focus Documents along with the TEKS Verification Matrix comprise the curriculum documents in CSCOPE. These documents are the foundation for all instructional planning. Effective curriculum development and backward design help educators avoid what Tomlinson and McTighe (2006) call “the twin problems” of textbook coverage and activity-oriented teaching with no clear priorities or purpose. They add that this design is directly tied to the following ideas:

- All learners benefit from clear priorities and purposes.
- Struggling learners require focus on truly essential knowledge to move forward.
- Advanced learners need challenge predicated on essential discipline knowledge in order to develop content expertise.

The CSCOPE curriculum is a foundation curriculum, guiding the “what” of instruction. The Vertical Alignment Document reflects a clearly articulated curriculum which should renew teachers’ understanding of the depth and breadth required by the TEKS. Teachers use the Instructional Focus Documents to anchor and plan instruction, keeping Instructional Focus Document content standards, desired understandings, and questions constant regardless of the student’s background. The Instructional Focus Document is the bridge from curriculum to instruction. These curriculum documents offer teachers a common place from which to differentiate and accommodate.

Furthermore, a process of continuous improvement is facilitated when administrators and teachers are able to hold to the specific content standards delineated in the Vertical Alignment Document, discuss authentic evidence (Performance Indicators, assessments) of what has actually happened in the classroom, collaborate in revisiting the Year at a Glance based on these data, and make instructional revisions accordingly.

The curriculum destination itself is non-negotiable since we are legally bound as educators to implement the state standards. However, the actual journey that teachers plan with their students may look quite different in that it will be responsive to differing student interests and abilities.

EXEMPLAR LESSONS

The lessons presented in CSCOPE are exemplar lessons intended to inspire decision making, teacher creativity, and appropriate use of available resources. They are resources which are intended to be models of what good instruction could look like. Regardless which curriculum a district uses, it is at the level of the lesson that teachers employ their expertise with the art of teaching, which incorporates their knowledge of individual students and their interests. Teachers will use the exemplar lessons as a standard of rigor and relevance. They share responsibility to address essential questions; however, methods, materials, and approaches may vary.

Marzano (2003) reports that a guaranteed and viable curriculum is the most powerful school-level factor in determining overall student achievement. Instructional strategies and classroom curriculum design are two of the most important teacher-level factors affecting student academic achievement (Marzano, 2003). CSCOPE exemplar lessons address these two factors by serving as a resource for how to structure lessons and a description of a variety of instructional strategies.

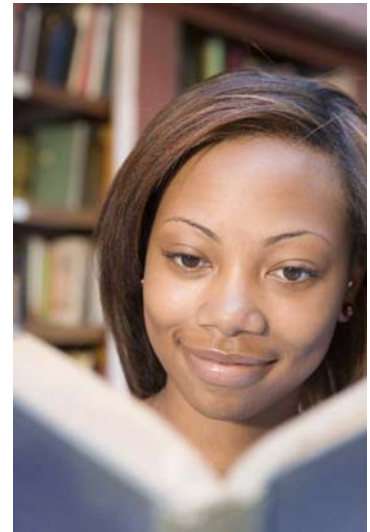
Tomlinson and McTighe (2006) report that classrooms with high levels of authentic pedagogy and assessment benefit both low- and high-performing students; inequalities between the two groups greatly decreased when normally low-performing students were taught in this way. CSCOPE exemplar lessons are based on the concepts of Understanding by Design (Wiggins & McTighe, 1998) and Mediated Learning Experiences (Feuerstein, 1980). Understanding by Design is a backward design model which identifies desired results and needed evidence before lesson planning can begin; these decisions are then implemented as teachers plan relevant instruction using a variety of engaging strategies. Mediated Learning Experiences are predicated on intentional interactions based on underlying principles, and infused with meaning by the teacher as mediator between the student and principles to be learned. The two concepts work hand in hand. Both models emphasize the importance of quality interaction in the classroom. Both emphasize metacognitive skills and learning how to learn. Both approaches are constructivist and explicit in nature.

In applying Feuerstein's concept of Mediated Learning Experiences to schools, it is not the case that students are "turned loose" without direction or guidance to learn on their own. Novice learners often lack the ability to access and engage prior knowledge and experience to make meaning of new knowledge or circumstances; they may be overwhelmed by the detail of the immediate experience, and they need help to infer general principles from a concrete experience (Petty, 2008). The teacher/mediator is central to this mediated learning experience. It is the teacher who brings content expertise and knowledge around enduring understandings, knowledge about pedagogy, and the ability to use flexible strategies to meet diverse

student needs. Teacher experts mediate students' experiences with content so that students are able to construct meaning in a variety of contexts.

Teachers are the content experts in the classroom. As such, it is useful to look at how experts make sense of content and new information. Experts' command of concept shapes their understanding of new information: it allows them to see patterns, relationships and discrepancies and make connections to relevant knowledge not apparent to novices. Experts can use their well organized knowledge of the structures of their discipline to chunk information, recognize problem types, and retrieve relevant information to make sense of contradictions. In other words, the patterns act as triggering mechanisms for experts (Bransford, 2000).

Effective teachers develop conscious awareness of the structure of their content and use that awareness to design meaningful and challenging tasks and problems so learners come to see the larger purpose and enduring understanding, need for basics, and attempt to use knowledge in meaningful ways. These teachers plan learning experiences and instruction which consider learner differences in interests, preferred modes, and affective needs; provide for ongoing formative assessment and responsive teaching; and utilize multiple modes, scaffolding, and a variety of formats (Tomlinson & McTighe, 2006). Students construct meaning through disciplined inquiry. The CSCOPE Exemplar Lessons provide a model for teachers to refer to; these lessons provide examples of how teachers can draw on their content expertise while allowing students to discover and learn.



Teachers must model and guide learning strategies so students develop a repertoire of flexible strategies learned and practiced in a community of learners where the emphasis is on learning how to learn, and not the one correct answer. They must use their expertise to do the following:

- identify relevant cognitive processes and design mediated interactions that focus student attention to critical elements and encourage abstraction of principles
- create meaningful and creative repetition so students experience the same cognitive processes in different learning contexts
- develop a plan of action that addresses expected difficulties of the students with the process
- directly point out or lead students to remember relevant knowledge

- create opportunities to observe similarities and differences across diverse events/contexts
- actively enable students to experience changes in understanding, and current interactions with principles to build pre-requisite skills for future learning
- use frequent formative assessment to make students' thinking visual
- make students aware of the strategies they used
- monitor actively, including seeking and using feedback
- characterize major themes, generalizable features, and strategies rather than specific solutions
- actively inquire into the students' thinking, make students aware of the strategies they used, and assist them to be aware of growth in their thinking (metacognitive skills) (Bransford, 2000; Schur, Mervyn, Zietsman, & Fridjhon, 2002).

Metacognitive skills are those which allow individuals to monitor their own understanding, identify when more information is required for understanding, and determine if new information is consistent with what they already know. Teaching practices congruent with a metacognitive approach (sense making, self assessment, reflection on what worked and what needs improving) have been shown to increase the degree to which students transfer their learning to new settings and events without explicit prompting. Teachers help students develop metacognitive skills by regularly asking learners to respond to reflective questions about their learning preferences, areas of need and ways to compensate for them and to and what strategies work for them, reflect on their own growth and set personal learning goals (McTighe & Wiggins, 2004; Bransford, 2000).

As Vygotsky tells us, learning is socially mediated. Learners are in a constant process of forming and re-forming their understandings based on their interactions with others. Therefore, CSCOPE Exemplar Lessons are highly interactive and designed using the 5-E Instructional Model, a lesson structure through which students engage, explore, explain, elaborate, and then evaluate their learning around concepts. (Bybee, et al., 2006).

There is a need to balance student construction of meaning and teacher guidance (explicit instruction). Using the 5-E Instructional Model, students have an opportunity to become *engaged* with and *explore* enduring understandings within various contexts. Teachers monitor student understandings and guide student reflection; they provide direct explicit instruction and *explanation* regarding enduring understandings using academic vocabulary. Students are then afforded opportunities to *elaborate* their understanding of learned concepts in new contexts. Finally, students and teachers *evaluate* student performance so that student are able to identify what strategies they have used successfully and in which areas they need to improve.

The 5-E Instructional Model may not be familiar to all teachers; the CSCOPE exemplar lessons provide a practical guide for what 5-E instruction looks like in the classroom. Bybee et al. (2006) reviewed a number of studies and reported positive results including one study that found that students whose teachers taught with medium or high levels of fidelity to the Biological Sciences Curriculum Study (BSCS) 5-E Instructional Model experienced learning gains that were nearly double that of students whose teachers did not use the model or used it with low levels of fidelity. The major finding of this study is the establishment of a strong relationship between student learning gains and implementation fidelity. Preliminary findings suggest that students who experience the 5-E Instructional Model have more positive attitudes toward science and increases in scientific reasoning skills.

The meaningful interactions and feedback that are central to the 5-E Instructional Model are critical to successful student learning. The reported impact of feedback in achievement ranges from an increase with a low of 21 percentile points to a high of 41. Both of these indicate that academic achievement in classes where effective feedback is provided to students is considerably higher than the achievement in classes where it is not (Marzano, 2003).

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(Kozulin and Presseisen, 1995, p. 74)

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As formative assessment data are collected regarding student understanding of concepts and enduring understandings and guiding questions, the teacher is able to use these data to modify classroom instruction to meet the needs of individual students and groups of students. The teacher holds all students accountable to the same standards, but may adjust instruction. It is through this feedback loop that the lessons become living, responsive documents.

UNIT ASSESSMENTS

High-stakes tests are, by necessity, a sampling of the written curriculum; therefore it is important to teach content in a broad range. The CSCOPE Unit Assessments are designed to assess the students' understanding of unit concepts and their ability to apply those concepts in a different context. English states that the written, taught, and tested curricula must overlap, with no "slack," if students are to successfully demonstrate mastery of the curriculum (English & Steffy, 2001). Districts may choose to use the CSCOPE unit assessment data in a variety of ways: as formative or summative assessment data, graded or ungraded, completed by individuals or groups of students.

Students reveal their understanding most effectively when they are provided with complex, authentic opportunities to explain, interpret, apply, shift perspective, empathize, and self-assess.

We live in an era where much depends on student performance on high-stakes tests and the correct answer; however, evidence of understanding is not equal to evidence that a student knows a correct answer. We are bound as educators to balance our responsibility of facilitating student success on these high-stakes tests with the responsibility to consider a portfolio of student learning achievement which gives a multi-faceted, complete picture of the student's understanding and which will guide teacher planning for instruction. Students reveal their understanding most effectively when they are provided with complex, authentic opportunities to explain, interpret, apply, shift perspective, empathize, and self-assess (Wiggins & McTighe, 2002). The unit Performance Indicators are designed around these facets. Additionally, teachers will recognize multiple formative assessment collection opportunities throughout the CSCOPE exemplar lessons. The comprehensive results of student achievement on the unit Performance Indicator(s), the unit assessments, and other formative and summative assessments provide a profile of the student's learning achievement.

Consistent monitoring of curriculum implementation is critical to maintaining continuous improvement. Student and school performance gains are achieved through regular reviews of results (achievement data and student work) followed by targeted discussion about and adjustments to curriculum and instruction (Wiggins & McTighe, 1998). In addition to classroom observation data, the data sets collected through the assessment and instruction components of CSCOPE provide concrete data as a basis for meaningful discussion and reflection among teachers and between administration and teachers. Data-driven discussions regarding curriculum implementation and evidence of student achievement (including unit assessments and unit Performance Indicators) as well as effective instructional practices and engaging learning experiences for students will be substantive. These conferences are a powerful professional development tool grounded in the evidence of student projects and performance which can also be used to identify and plan for interventions which address student needs.

IN CONCLUSION

In order to sustain continuous improvement several attributes must be in place. According to Jacobs (1997) these attributes include the following:

- a specific observable and measurable proficiency
- ongoing collection of performance data; item analysis of those data
- review both horizontally and vertically among the actual people responsible for instruction
- adjustments to the instruction based on the item analysis
- planning time on a regular basis for review of student performance among the people who share the care and instruction for the target population
- sufficient time to allow for sustained growth among the students

Jacobs suggests that the result of mapping is “deliberate accountability; precision articulation of common student performance goals both horizontally and vertically; and ongoing review of those goals in real time” (Hale, 2008, ¶ 4).

These attributes are consistent with the CSCOPE curriculum. Having CSCOPE is not enough. The biggest impact of CSCOPE will be in the ongoing curriculum and instruction discussions around vertical alignment, instructional focus, lesson planning, and pedagogy.

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