Module 8

Engineering & Facilitating High-Quality Instructional Practices and Environments

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Introduction

Powerful student learning is developed primarily through pedagogy, not curriculum (Wiliam, 2007). All things being equal, what teachers do is more important than what they know about the content that they teach. This is an important point to keep in mind because a curriculum that is too broad in scope will force the instruction that teachers provide to frantically focus on coverage rather than create opportunities for deep engagement and thus deeper understanding. In addition, a curriculum that has too much breadth will make it much more difficult for teachers to go in depth. Such a situation complicates and encumbers the instructional process, resulting in confusion for the learner. In short, a curriculum that is too wide impacts students in that the learning objectives are seen as a series of isolated concepts that are not connected to one another—both within the same subject and across the curriculum.

Breadth and depth of curriculum notwithstanding, Dylan Wiliam, international formative assessment expert and co-author of *Inside the Black Box* (Black & Wiliam, 1998), believes that *how* teachers teach becomes paramount when compared to *what* teachers teach. In short, the road to improved learning outcomes for students is most impacted by not necessarily altering what is

taught, but changing how the teacher engineers the learning environment so that deep levels of learning occur. The term *engineer* in this case does not mean the physical space. Instead, it relates to showing the deep connections between the learning targets, the evidence that will be collected to demonstrate mastery of the targets, and the instructional activities that will be utilized to facilitate student mastery of them. The purpose of this module is to engage the readers in considering what district and building conversations need to occur in order to more effectively establish common instructional language so that the educators in the system can more effectively engineer and implement high quality instructional environments and practices in every classroom in every building in the district.

Factors for Adults to Consider During Inquiry

There are many important factors that affect the achievement levels of students; some factors are indeed beyond the control of the school (Guthrie, 2005). prior achievement, gender, ethnicity, socio-economic status, language background and the presence of disabilities that may affect learning have been cited by researchers as variables that are not within the control of the school, but do account for student achievement variance among groups (Muthen, Huang, Jo, Khoo, Goff, Novak & Shih, 1995; Sammons, Nuttall, Cuttance & Thomas, 1995). Conversely, and perhaps most important, there is sound research indicating that despite factors that are beyond the control of the school, students can and do achieve at high levels if certain factors that *are* within the control of the school are indeed addressed. (Reeves, 2000). For this action to occur it is important for

the adults in the educational system to have a clear understanding of the following concepts:

1. *Know the research and be able to practically apply it.* There is a plethora of research on instruction to demonstrate that some instructional strategies produce a larger effect on student learning when compared to others. Educators should have a strong, practical knowledge of the things that work within the classroom and know that the utilization of the techniques depends on what is being asked of the learner. The cognitive difficulty level of the learning target(s) may align more readily with the application of one particular strategy when compared to another (Marzano, 2009).Facilitating high quality instructional practice requires more than simply looking at the effect size of a very specific strategy and forcing implementation of this strategy in every classroom all of the time.
2. *Connect student effect data with adult causal data because implementation and focused monitoring are critical to the success of improvement efforts.* Knowing what strategy works and actually implementing and monitoring the determined strategy have not been a common practice with educators. While districts and schools have made improvements in looking at student data, educators need to investigate adult implementation data as critically, honestly and respectfully as they analyze student results data. If educators are to improve learning outcomes for all students, they need to have the

courage and steadfastness necessary to deeply implement a limited number of focused strategies and action steps. This process begins with an inquiry into what the adults in the system are doing in order to elicit student results. Further, establishing a common, district-wide instructional language will help students as well as educators who will need to engage in both vertical and horizontal communication about instructional techniques. If educators implement common innovations, they can have more meaningful conversations pertaining to implementation.

3. *Provide administrative support through instructional leadership.* It is paramount that the administrative leaders in the organization have an understanding as to the critical nature of their respective roles and how they can be catalysts for establishing a coherent instructional language. Further, they should be adept at observing and providing non-evaluative feedback on the instructional process. Principals are in the position to be instructional leaders and it is their responsibility to support the development of high quality instruction within their respective buildings.
4. *Establish cultures of trust.* Professional growth is enhanced when the adults in the system feel supported as they try new things. There is a degree of vulnerability and awkwardness that is present during implementation as both efficacy and efficiency develop. Teachers will need to have administrative support and one another's support to grow

professionally. A safe and trusting environment is vital in order for this level of instructional inquiry to occur. This can be facilitated by providing structured time for teachers to meet to specifically discuss implementation.

Ohio's Leadership Development Framework

A fundamental purpose of leadership, regardless of the role of the adult, is the improvement of instructional practice (Elmore, 2006). Therefore, the work of all educators in the system is directly linked to the skillful use of effective instructional methods. The Ohio Leadership Advisory Council has identified essential leadership practices that superintendents, District Leadership Teams (DLTs), and Building Leadership Teams (BLTs) should use to increase student achievement. These leadership practices are grouped into six core areas, which all focus on supporting improved instructional practice. These six areas include: Data and the Decision Making Process; Focused Goal Setting Process; Instructional and the Learning Process; Community Engagement Process; Resource Management Process; and Board Development and the Governance Process.

Area Three, Instruction and the Learning Process, is the one most clearly focused on delineating the core instructional practices that must be upheld. To improve the quality of instruction, any skillful leader must employ various organizational, instructional, leadership, and programmatic strategies, which will be discussed in this module after a summary of the research on effective instruction is presented. Lastly, deep implementation of effective instructional

strategies is achieved only through continuous, job-embedded professional development, multiple opportunities for practice and feedback, and conscientious monitoring of adult actions by teachers and administrators. These components of effective instruction and their direct links to the BLTs and DLTs will be discussed as well. In Area Three, *Ohio's Leadership Development Framework* addresses instruction by urging superintendents, DLTs, and BLTs to:

- Ensure that all children combine core subject mastery with other significant skills, including critical thinking and problem solving, creativity and innovation, communication, and collaboration skills; information and communication technology literacy; life skills; and 21st century content.
- Develop collaborative structures (e.g., district, department, building, and teacher-based teams) to facilitate communication, build credibility, and stay focused on the collective, shared responsibility for improving student achievement.
- Provide full access to challenging content aligned with rigorous standards for all students and student groups as part of closing the achievement gap (p. 22).

Summary of the Research on Effective Instruction

"What 'some' teachers do matters—especially those who teach in a most deliberate and visible manner (p. 22)." -- John Hattie (2009)

District Leadership Teams (DLTs) and Building Leadership Teams (BLTs) promote common expectations and maintain focus on the goal of high

achievement for all students. Central to improving achievement is improving instruction and ensuring that there is a common and shared instructional language throughout the system. A collective focus in every classroom, every building, and every department across the district on a few, powerful strategies must occur if improvement is to be sustained. While individual teachers may have a multitude of instructional strategies that they utilize throughout the instructional day, the connection that is being made here is a systematic focus on a few macro strategies that are applicable to nearly all instructional situations. As teachers throughout the system applying these macro strategies, discuss the implications and student results, observe and learn from one another during application, they are contributing to the establishment of a systemic instructional language. Each district has a focused plan that includes goals, strategies designed to help reach those goals, results indicators to use in gauging progress, and action steps related to each strategy. These district plans are guiding documents under which school plans are created and implemented. When schools focus on implementing a limited number of focused strategies and actions to reach a few goals at a deep level, and when they collect data about the relationship of the employment of strategies to changes in student performance, they can improve student learning dramatically (Reeves, 2006; Reeves, 2008; Schmoker, 2001).

Hattie's (2009) recent work entitled, *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement* is an excellent resource for all educators in that it serves as a helpful guide to provide practitioners with insight

as to which educational innovations have the greatest impact on improved student achievement. An innovation in this case is defined as a technique or strategy that has demonstrated a greater than average effect on student learning. Hattie's work is a summary of meta-analyses. Hattie points out that there are many educational innovations that make an impact on student achievement. Some innovations have a more profound impact on student achievement when compared to others. With resources being an issue (i.e., limited resources that include money, time and staff), a most important question of, which innovations provide more benefit when cost is a consideration becomes paramount. In short, schools and districts do not have the resources to implement everything that has been demonstrated to make an impact on student learning. In research, the impact of a particular strategy is explained using a statistic called *effect size*. Effect size is represented as *d* (e.g. *d=0.41)*. Effect size is reported in terms of standard deviation units and it can be explained in terms of percentile rank. Positive effect sizes indicate a positive influence on student learning whereas negative effect sizes indicate a converse effect. If the bar is set at zero in order to determine whether or not a given strategy or technique makes a difference in student achievement, the majority of educational influences yield an effect size that is positive. Ninety-five percent of educational innovations do have a positive influence, or in this case "effect," on student achievement (Hattie, 2009).

More effective instructional strategies have a larger effect size on student achievement. An effect size of *d*=1.0 would indicate an increase of a full standard deviation or approximately a 34 point percentile gain Hattie postulates that a

d=1.0 effect would be associated with advancing a child's learning by two to three years. In more practical terms, assume that a research study wanted to see if a particular educational innovation was effective. The study found that the educational innovation produced an effect size of d=0.74. An effect size of this magnitude is approximately 27 percentile points. In this case, the score of the average person in the study whose teacher used the educational innovation would be 27 percentile points higher than the average score in the group where the teacher did not use the innovation. The student who experienced such an effect would have his or her learning trajectory significantly altered.

Hattie (2009) reports that teachers' average an effect of *d*=.20 to *d*=.40 per year on student achievement (i.e. about 8 to 15 percentile points). However, he indicates that such a hinge point does not mean simply placing a teacher in front of a classroom of students would lead to an improvement of .40 standard deviations. While some innovations determined effective through a meta-analysis do demonstrate a positive effect, the context and student audience where they are used can sometimes show varying effects. Nevertheless, an innovation that demonstrates an effect of greater than *d*=0.40 serves as a hinge point and is considered to be a medium effect. An effect size of greater than *d*=0.60 (about 23 percentile points) is considered to be a large effect.

In *Visible Learning*: *A Synthesis of Over 800 Meta-Analyses Relating to Achievement,* Hattie (2009) divides the major contributors to learning into six categories: Student, Home, School, Teacher, Curricula and Teaching. Many educational innovations whose application is largely controlled by the entity that

can be referred to as the “school district” do make a difference. Rather than asking, “what works” the question should focus on “what works better” or “what works best.” Table 1.0 below demonstrates the previously mentioned six major contributors in order of effect size. To demonstrate the magnitude of Hattie’s (2009) work the number of studies, people they impacted and effects are also listed.

Table 1.0

Average Effect for Each of the Major Contributors to Learning

Contribution	Studies	People	Effects	Effect Size (*d*)
School	4,150	4,416,898	13,348	0.23
Home	2,211	11,672,658	5,182	0.31
Student	11,101	7,513,406	38,282	0.40
Teaching	25,860	52,128,719	55,143	0.42
Curricula	7,102	6,899,428	29,220	0.45
Teacher	2,225	402,325	5,559	0.49

This module is not meant to be a complete review of Hattie’s (2009) synthesis as the limited amount of space would not do justice to his contribution. Instead, the focus here will be on some of the most salient educational innovations that were illuminated from Hattie’s investigation as they pertain to teachers and teaching. These variables are within the control of educators. In this case, salient will be defined as instructional innovations that exceed an effect size where *d* is greater than 0.60, and whereby the application for teachers can be done so in a broader context. Those wishing to obtain a more comprehensive overview of the research on effective instructional practices should consult *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement* (Hattie, 2009).

As this module is meant to focus on effective instructional practices, the review will be mostly limited to selected educational innovations within the categories or contributions from *Teacher* and *Teaching*. One non-teaching/teacher strategy that does deserve to be mentioned is from the category of *Students*. The practice that demonstrated the largest effect size reported by Hattie (2009) is self-reporting grades (d = 1.44). This finding was obtained through the analysis of six meta-analyses that contained 209 studies, and it demonstrates that students are reasonably accurate when it comes to predicting their achievement levels. This finding should not be interpreted to signify that the practice of classroom assessments should be abandoned. Rather, as teachers engineer their respective instructional environments for student success, it is important to recognize that students have a great deal to offer by predicting their current levels of learning. Teachers can use this student self-knowledge in their instruction by creating a learning environment where students are required to continually engage in a self-assessment process in order to determine where they are in relationship to a unit of instruction's desired learning outcomes. This can serve as a valuable feedback tool for both the student and the teacher.

Contributions from Teaching & Teachers

Educational research has demonstrated that some instructional techniques are more effective than others; however, the context in which selected techniques are applied becomes very important. A recent article by Marzano (2009), *Setting the Record Straight on High Yield Strategies*, illuminates this point. In *Classroom Instruction That Works*, Marzano, Pickering, & Pollack

(2001), conducted a meta-analysis that identified nine instructional strategies whose impact was described using effect size. Many practitioners used the instructional strategies cited in this work because many of the effect sizes were large (e.g., Similarities and Differences, d=1.61 or 45 percentile points) and many administrators required teachers to implement only these nine strategies. Recently, Marzano cautioned educators in over-applying these techniques and cited three common mistakes. He indicated that 1). Educators focused on a narrow range of strategies—in this case only the nine that were cited in his previous work; 2) Educators assumed that these strategies must be used in every classroom; and 3) Educators assumed that applying the nine strategies would always work.

Marzano (2009) makes several important points. The nine strategies identified in *Classroom Instruction That Works* may be a helpful place to start in establishing a common instructional language; however, they should not be overly or robotically applied. While it is important for educators to use research-based instructional strategies, they need to be mindful when using them. Marzano points out that it would be a mistake to simply focus on the nine identified strategies that he and his authors' found in their meta-analysis without considering the instructional situations where and when they are applied if an instructional strategy that has been demonstrated to be effective based on research has been implemented with fidelity and it does not produce the results that were hoped for, clearly another strategy should be considered. The most important practice to remember about the application of instructional strategies

is the importance of teachers collecting real-time student data in order to determine if students are gaining knowledge so that instructional adjustments can be made.

Macro-Educational Innovations

There are several questions for teachers to consider when attempting to engineer and facilitate a high quality educational classroom experience for their learners. The question of *what is to be learned* is determined by the academic content standards for a particular grade level. When the content is taught is typically addressed through curriculum mapping and pacing. The remaining four questions are: *what does mastery look like*; *what techniques can a teacher use to engineer an effective teaching environment in order to facilitate mastery*; *what are the most effective strategies to use in order to scaffold learning or address the learning progressions of the content* and the final question is *how should the strategies be implemented, monitored and checked to see if they are impacting student learning*. The ultimate question, “did it work” can only be answered if full implementation occurs. A high quality educational experience is much more than a refinement of the inputs (a streamlining of the learning standards) and outputs of the system (summative assessments whose contents are stable, clear and consistent across the United States). While these will offer assistance, mastery learning won’t occur unless educators change instructional practice in order to help students construct meaning as their learning is taking place in real time.

Dylan Wiliam (2007) indicates that teachers do not create learning, only learners create learning. While this may indeed be the case, it is important for

teachers to engineer an effective environment that purposefully sets the conditions for higher levels of understanding and learning to take place. In this section, three macro instructional techniques will be reviewed that have demonstrated considerable effect sizes. They serve as a means to establish a common, professional instructional language and can be used to engineer effective classroom discussions, tasks, and activities that elicit evidence of learning (Wiliam & Thompson, 2007). When joined together and implemented as a matter of routine within the classroom, student learning is directly impacted by this excellence in teaching. These three innovations are teacher clarity (*d*=0.75), providing formative evaluation of programs (*d*=0.90) and feedback (d=0.73).

An effective instructional environment begins with students having a clear and understandable vision of the learning goals. This clear vision for students assumes that the teacher has spent the necessary time to fully understand the learning targets and the progression of how a student arrives at mastery. Moreover, the teacher comes to the conclusion as to not only which are the most salient learning objectives within the curriculum (Ainsworth, 2003), but which are the most important for the unit of study at hand.

While it is important for a teacher to understand what the learning targets are and the progression towards mastery, the teacher need not conduct this important work in isolation. For instructional coherence to exist within a school and within a district, this work is more effectively conducted collaboratively with teachers who teach the same grade level or content. Student clarity is further enhanced when teacher clarity occurs. Having collaboratively determining what

the most important learning targets are for the content area they teach coupled with these teacher-based teams coming to agreement on what these learning targets look like when their students master them is an important step in establishing a common instructional language and creating a guaranteed and viable curriculum.

Clarity becomes further enhanced when teachers share models of strong and weak work (Chappuis, 2009) and the criteria for success with students. Many times teachers use rubrics as a method to help students understand the criteria for success. While this method does begin to set the conditions for clarity, simply handing students the rubric may not bring about the kind of powerful clarity that will increase learning; especially if it the rubric is in "teacher-speak."

There are many opportunities for teachers to increase the clarity of learning targets for students and use rubrics without showing the rubric to students right away (Stiggins, 2007). Imagine an 8th grade English Language Arts classroom where students typically work on several forms of writing throughout the school year. For an up-and-coming unit of instruction, the students' culminating assessment will be completing a persuasive essay. Below are two scenarios where teachers use rubrics to make learning targets clearer to students.

Scenario 1

"We have been working on our writing all year and we're going to learn about a new form of writing called persuasion. Our assessment for the unit will be to write a three-part persuasive essay. We have been using writing rubrics all year

in order to help all of you write better. Here is the rubric that I will use in order to evaluate your final writing. Please get with your partner and talk about this rubric."

Scenario 2

"As you know we've been working on our writing all year and for this unit we're going to work on a form of writing called persuasion. Our assessment for the unit will be to write a three-part persuasive essay. I'm passing out two essays that I saved from last year. One essay is an example of strong work, whereas the other is not. Individually read both essays, and then get into groups of four.. While you may not know a great deal about persuasive essays yet, you do know what good writing looks like. Discuss the components of each essay. What makes it strong? What makes it weak? How could the essays be improved? Be prepared to report your discussions to the class." As the students report out, the teacher lists the components of quality persuasive writing and groups them. Next, she distributes the persuasive writing rubric to her students much like the teacher did in Scenario 1. She then says, "Look at the things that each of your groups reported. You can see from the discussions you had that you've identified many of the quality components of a persuasive essay. What we're going to do now is take the rubric that I've distributed, and we're going to transform the items that I've written into your words."

Scenario 1 and 2 might very well be engineered by two effective teachers; in fact, they could be exhibited by the same teacher—the first example being from his or her first few attempts at using rubrics with students. Both teachers are

similar in that they have set clarity as a priority and both use rubrics in order to increase student understanding; however, there is a qualitative difference in each approach. The teacher in Scenario 1 may have student clarity as an objective; however she missed an instructional opportunity to get students to engage with one another prior to showing the students what the criteria for success were. The teacher in Scenario 2 likely brought greater clarity to the criteria for success because she paired it with samples of strong and weak work and had students critique it. The difference between them is that the teacher in Scenario 2 brings about clarity through more student engagement as evidenced by having students discuss the quality components that she is looking for prior to introducing the rubric. Engagement of students in evaluating their own work for quality can happen during the course of learning and within the instructional milieu. Student self-assessment is a powerful mechanism to increase student involvement and learning (Stiggins, 2005; Stiggins, 2007; Stiggins, 2009: Stiggins, Arter, Chappuis & Chappuis, 2006; Wiliam, 2008).

There are other methods whereby teachers can create classroom conditions that bring about clarity. Displaying the learning intentions for a lesson or an instructional unit along with the big ideas and essential questions that guide a unit of instruction might very well bring about clarity too. However, it is important for teachers to keep in mind that in order to engineer an instructional environment where clarity is a priority that they will need to do more than simply display learning targets. It is important that these displays are brought into classroom discussions throughout the process. Taking brief pauses during

instruction, pointing out the posted learning targets and having students articulate what they are learning and why, will likely further clarify the learning intentions.

One very important component for teachers to consider as it relates to teachers making the learning intentions clear to students is making a distinction between performance activities and learning goals. For instance, students in a middle school science class may be participating in a lab where they are examining different types of rocks and minerals. While the performance goal may be, that students will “complete the rock and mineral lab,” it is not the learning goal. The learning goal should be stated as an instructional target, stating that students will “explain that rocks are made up of different materials.” This instructional target is accompanied by an essential question that helps further organize the unit of instruction such as, “What properties determine different rocks (and minerals), and how can you use these properties to identify those rocks (or minerals).” By differentiating between activities and learning goals, teachers help students to differentiate between what they are doing and what they are learning.

During instruction, it is imperative that students see the difference along with the connection between the learning targets and the learning activities that are meant to elicit learning. The teacher can begin to move around the room during the instructional activity and ask students questions that are directly related to the learning target or essential question. Such a distinction shows students that the activity is the means and the learning is end (Chappuis, 2009)

and it serves as a way to clarify, understand and share the learning intentions (Wiliam & Thompson, 2007).

Formative Evaluation of Programs

Hattie (2009) identified teachers formatively evaluating their programs as making a tremendous impact on student learning (d=0.90). In short, as teachers clarify the learning intentions for students and use the feedback that students provide to them to alter their instruction it results in the formative evaluation of programs. In order for a student to begin to self-assess, he or she needs to have a clear understanding of what the destination is. It helps the student self-regulate and begin to consider two very important instructional questions—"Where am I going?" and "Where am I now?" As teachers also center their instruction on these two prime instructional questions they can begin to gather formative evaluation data about their teaching. Such formative evaluation information is obtained from students who are providing the minute-to-minute evidence to teachers as to what is working and what isn't. As teachers pay attention to and consider this valuable information, they act on it by making small adjustments to their instruction when there is still time to help students learn.

As teachers begin to more deeply think about the effectiveness of their teaching and help students to see where they are in relationship to the learning progressions, it leads to the third instructional innovation that has been demonstrated to have a considerable effect on student learning—feedback (Hattie & Timperly, 2007). Clarity helps students understand "where am I going?"

Formative evaluation of programs helps teachers understand “where are they now?” When feedback is provided to students from the teacher, from peers and from self, students can more deeply understand where they are in relationship to where they are going.

Feedback

When coupled with clarity the provision of feedback, when done well and as a matter of routine, has a profound impact on student learning. Instruction becomes something that is done *with* students rather than *to* students and three main questions emerge for the learner. Where am I going? Where am I now? How can I get there? (Brookhart, 2009; Brookhart 2008a; Brookhart 2008b; Brookhart, 2006; Hattie & Timperly, 2007; Wiliam & Thompson, 2007). Instructional feedback helps the student to begin to monitor where they are in relationship to where they need to be. When feedback is incorporated into the instructional milieu of teachers, it becomes indistinguishable from high quality instruction (Stiggins, Arter, Chappuis & Chappuis, 2006).

The purpose of instructional feedback is to fill the gap between what is understood and what needs to be understood (Chappuis & Chappuis, 2008). Feedback is most powerful when students received information about a task and how to do it more effectively. It is least powerful when it only acts as praise, and when students are given only a reward or punishment (Hattie & Timperly, 2007). While the research demonstrates that feedback makes an impact on student learning, it is important to keep in mind the context, the delivery and what students do with it once it is received. Kluger and DeNisi (1996) found that

feedback can worsen student performance when it focuses on the person, rather than the task. For instance, a teacher who says, “You did that wrong” provides feedback, however it is feedback that doesn’t help a student begin to plan to close the gap. Conversely, teachers assisting students with corrections that are coupled with, “this is good, now do this” or “what do you need to do next” is feedback that has a tendency to feed forward—students can use it to improve the quality of their work and make growth in their learning.

The goal of education is to engineer and facilitate high levels of learning for all students. This requires more than simply learning and practicing new things. As Wiliam indicates, “new knowledge doesn’t just have to get learned and practiced, it has to go up against long-established, familiar, comfortable ways of doing things that may not be as effective, but fit within everyone’s expectations of how a classroom should work (Wiliam, 2007).”

Teaching 21st Century Skills Effectively

Students need a rigorous education to thrive in our constantly changing, modern world. A rigorous education now consists of proficiency in the core academic subjects plus critical thinking, problem solving, communication, collaboration, creativity, health and financial literacy, and global awareness (Kay, p. 41). One reason that schools need to drastically change their definition of rigor is because the careers available to today’s students are varied and are not the careers of their parents and grandparents. For example, between 1995 and 2005, the United States lost three million manufacturing jobs, according to the U.S. Bureau of Labor Statistics, and in that same decade, 17 million service-

sector jobs were created (Partnership for 21st Century Skills, 2008). As the world grows increasingly "flat" (Friedman, 2005), with many jobs being outsourced or conducted via the Internet across lines of time and geography, modern-day students must be savvy collaborators, innovators, and users of all available technology.

The 21st Century Skills initiative builds upon earlier, similar recommendations put forth by the United States Department of Labor (1991). The skills and competencies set forth in that report, commonly known as the SCANS report, consist of basic skills (in the core academic subjects plus listening and speaking), thinking skills (including problem solving), personal qualities (including self-management), resource skills (including using time and available resources wisely), interpersonal skills (including leadership and collaboration), and information, systems, and technology skills.

Critical thinking and problem solving remain important in the call for 21st century education, but there is also a push for interdisciplinary learning. The Partnership for 21st Century Skills promotes the interdisciplinary themes of global awareness, economic and business literacy, civic literacy, and health literacy (2009).

Some of the most compelling evidence indicating the need for American students comes from international assessments, including the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA). From 1993 to 2003, American 8th

graders performed above average on the TIMSS, but well below the scores of nations like Singapore and Korea on both math and science (http://timss.org/). On the PISA, which is designed to test students' ability to apply math and science to real-life situations, American teens are among the worst performers, scoring well behind the number 10 performer, France (Silva, 2008). In addition to developing the "soft skills" like innovation and collaboration, American students appear to need higher-quality instruction in both math and science in order to be globally competitive.

School systems must focus their efforts in the directions outlined in the 21st century skills materials and resources so that all students are well prepared for the academic and workplace challenges that lie ahead in an increasingly globalized, highly technical, collaborative world. The Ohio Improvement Process and its focus on district leadership teams, building leadership teams, and teacher-based teams will ensure that emphasis is placed on the improved achievement of all students via excellent instruction in all classrooms. Through the Ohio Improvement Process, District Leadership Teams and Building Leadership Teams determine the critical needs in a district, and these needs become the basis for the focused plan. Special attention should be paid in the determination of needs processes to ensure 21st century skills are incorporated.

Summary, Conclusions & Connections

Engineering and facilitating high-quality instructional practice and environments is critical because good first instruction serves as a student's best educational intervention. In order to facilitate student success within a

standards-based curriculum and meet the challenges of 21st Century society and beyond, it will be important to increase the quality of instructional practices to an even more adept level. In order to do this, teachers and high quality teaching practices are the most critical resources.

Ensuring that students' learning environments are effectively engineered and facilitated is the responsibility of all of the educators within the system. Regardless of role, the educators within the system must know the implications of educational research; be able to connect student effect data with adult causal data because implementation and focused monitoring are critical to the success of improvement efforts. Further, administrators from the central office to the building level must provide support through instructional leadership. Finally, for systemic improvement to occur, teachers must feel that they are part of a culture of trust so that they can be comfortable trying new things and reflecting on their practices for professional growth to occur.

This module focused on instructional practices and belief systems and stated that what teachers do is more important than what they know. This means that while there isn't a knowledge gap in the profession of education there does indeed appear to be a considerable implementation gap. The summary of the research on effective instructional practices demonstrates that there is ample evidence pertaining to what works. We know what makes a difference which is why the improvement of instructional practice won't occur simply by having teachers learn new things. The key will be implementation.

The summary of research in this module demonstrated that the top three contributions based on their effect size and impact on student learning came from the Teacher (d=0.49), the Curricula (d=0.45) and Teaching (0.42) when compared to the Student (d=0.40), the Home (d=0.31) and the school (d=0.23). The analysis then proceeded to look at the top contributions from Teaching and Teacher. While teachers have a variety of micro instructional strategies at their disposal to apply during appropriate classroom moments, the module focused primarily on macro educational innovations within the realms of Teaching and Teacher.

Macro educational strategies, as opposed to micro educational strategies, can be applied in nearly all educational environments and at a higher frequency. The three macro educational innovations reviewed here were clarity of the learning intentions by the teacher; formative evaluation of programs and feedback. Unlike a classroom strategy such as generating and testing hypothesis whose impact is high, but opportunity to use narrower; the macro educational innovations can be broadly used. These macro strategies can also help the educators within the system begin to establish a common instructional language because the application is broad.

Where ever a district may be as it relates to an instructional language (at the beginning stage or the synthesizing stage), it is important that the District Leadership Team put instructional coherence towards the top of its list of priorities., The only way to improve student learning outcomes is through high

quality instructional practices. Teachers are the most important resource – they are the engineers of the instructional environments.

References for Module 8

Ainsworth, L. (2003). Power standards: Identifying the standards that matter the most. Englewood, CO: Advanced Learning Press.

Black, P. & Wiliam, D. (1998). Inside the black box. *Phi Delta Kappan, 80*(2), 139-148.

Brookhart, S. (2009). *Exploring formative assessment*. Alexandria, VA: ASCD.

Brookhart, S. (2008a). Feedback that fits. *Educational Leadership*, *65*(4), 54-59.

Brookhart, S. (2008b). *How to give effective feedback to your students*. Alexandria, VA: ASCD.

Brookhart, S. (2006). *Formative assessment strategies for every classroom*. Alexandria, VA: ASCD.

Chappuis, J. (2009). *Seven strategies of assessment for learning*. Portland, OR: Assessment Training Institute.

Chappuis, S. & Chappuis, J. (2008). The best value in formative assessment. *Educational Leadership, 65*(4), 14-18.

Chappuis, S., Stiggins, R.J., Arter, J. & Chappuis, J. (2004). *Assessment FOR learning: An action guide for school leaders*. Portland, OR: Assessment Training Institute.

Darling-Hammond, L. (2010). The flat world and education: How America's commitment to equity will determine our future. New York: Teachers College Press.

Davies, A., et al (2009). Position paper on assessment for learning from the 3rd conference on assessment for learning, retrieved from http://bulldogcia.com/Documents/Articles/AfL_Position_Paper_Anne_Davies.pdf

Fisher, D. & Frey, N. (2009). Feed up, back, forward. *Educational Leadership, 67*(3), 20-25.

Fisher, D. & Frey, N. (2007). *Checking for understanding: Formative assessment techniques for your classroom*. Alexandria, VA: ASCD.

Friedman, T. (2005). *The world is flat: A brief history of the 21st century.* New York, NY: Farrar, Straus and Giroux.

Gutherie, J.W. (2005). An education professions performance development act: A prospectus for providing highly qualified and more motivated teachers and leaders for America's schools. *Peabody Journal of Education, 80*(3), 6-14.

Hattie, J. (2009). Visible Learning: A synthesis of over 800 meta-analyses relating to achievement. London: Routledge Taylor and Francis Group.

Hattie, J. & Timperly, H. (2007). The power of feedback. *Journal of Educational Research*, *77*(1), 81-112.

Kluger, A.N. & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254-284.

Marzano, R.J. (2009). Setting the record straight on “high yield” strategies. *Phi Delta Kappan, 91*(1), 30-37.

Marzano, R.J., Pickering, D.J., & Pollock, J.E. (2001). Classroom instruction that works. Alexandria, VA: Association for Supervision and Curriculum Development.

Muthen, B., Huang, L., Jo, B., Khoo, S., Goff, G., Novak, J., & Shih, J. (1995). Opportunity-to-learn effects on achievement: Analytical aspects. *Educational Evaluation and Policy Analysis, 17*(3), 371-403.

Papert, S. A. (1998, 2 June). Child power: keys to the new learning of the digital century. Paper presented at the 11th Colin Cherry Memorial Lecture on Communication held at Imperial College London. Available at http://www.papert.org/articles/Childpower.html.

Reeves, D. B. (2000). *Accountability in action: A blueprint for learning organizations*. Denver, CO: Advanced Learning Press.

Reeves, D. B. (2006). *The learning leader: How to focus school improvement for better results.* Alexandria, VA: Association for Supervision and Curriculum Development.

Reeves, D. B. (2008). *Reframing teacher leadership to improve your school.* Alexandria, VA: Association for Supervision and Curriculum Development.

Sammons, P., Nuttal, D., Cuttance, P., & Thomas, S. (1995). Continuity of school effects: A longitudinal analysis of primary and secondary school effects on GCSE performance. *School Effectiveness and School Improvement, 6*, 285-307.

Schmoker, M. (2001). *The results fieldbook: Practical strategies from dramatically improved schools.* Alexandria, VA: Association for Supervision and Curriculum Development.

Silva, E. (2008). Measuring skills for the 21st century. Retrieved May 24, 2009 from http://www.educationsector.org/usr_doc/MeasuringSkills.pdf. Washington, DC: Education Sector.

Stiggins, R.J. (2005). From formative assessment to assessment for learning: A path to success in standards-based schools. *Phi Delta Kappan, December*, 324-328.

Stiggins, R.J. (2007). Assessment through the student's eyes. *Educational Leadership, 64*(8), 22-26.

Stiggins, R.J. (2009). Assessment for learning in the upper grades. *Phi Delta Kappan*, February, 419-421.

Stiggins, R.J., Arter, J., Chappuis, J. & Chappuis, S. (2006). *Classroom assessment for student learning: Doing it right—using it well*. Upper Saddle River, New Jersey: Prentice Hall.

TIMSS and PIRLS International Study Center (2007). Executive summary retrieved May 24, 2009 from http://timss.org/.

Wagner, T., Kegan, R., Lahey, L.L., Lemons, R.W., Garnier, J., Helsing, D., Howell, A., & Thurber, H. R. *Change leadership: A practical guide to transforming our schools*. Hoboken, NJ: Wiley, John & Sons, Inc.

Wiliam, D. (2007). 3rd Tomlinson memorial lecture: Assessment for learning: Why it matters for all students. Retrieved from http://dylanwiliam.net on March 17, 2010.

Wiliam, D. (2008). Changing classroom practice. *Educational Leadership, 65*(4), 36-41.

Wiliam, D., & Thompson, M. (2007). Integrating assessment with instruction: what will it take to make it work? In C. A. Dwyer (Ed.), The future of assessment: shaping teaching and learning (pp. 53-82). Mahwah, NJ: Lawrence Erlbaum Associates.

Reflection Questions for Module 8

1. With your DLT, BLT or TBT, consider the following statement:

   The most important difference between the most and least effective classrooms is the teacher, but the most important variable appears to be what they do, rather than what they know (Monk, 1994).

   a. What implications does this statement have for your district's professional development initiatives?

   b. What implications does this statement have for improving instructional practice?

2. If we know what works in education, what don't we do it? What do we need to do as educators in order to get where we think we should be?

3. How can your team work to more fully align curriculum, assessment and instruction?

Activities for Module 8

1. According to Hattie's Visible Learning (2009), there are many instructional innovations that are within the control of the school and teacher that make an exceptional impact on student learning. List your agreed upon instructional strategies, the adult implementation data you collect and the student effect data. What impact do they have? Do you have the necessary data in order to determine they are implemented with fidelity and if so, effective?

2. One of the macro instructional innovations discussed in the module is *teacher clarity*. With your team:

   a. Define what clarity means.

   b. What does clarity look like within the educational environment (note—clarity takes many forms)?

   c. Conduct a few classroom visitations and only look for clarity. How many times did your team witness it? What did it look like?

d. As a TBT, make a commitment to overtly make the learning targets clear for students during a lesson/unit. What impact did this have on student understanding?

3. One of macro innovations discussed in the module is *feedback*. With your team:

    a. Define what effective feedback is.

    b. Who provides feedback? How does it look when it is being effectively provided in the instructional environment?

    c. Conduct a few classroom visitations and only look for feedback. How many times did your team witness it? What did it look like?

    d. As a TBT, make a commitment to overtly implement feedback as a priority—even more than is currently done. Teach a lesson and overly incorporate feedback. What impact did this have on student understanding? What impact did it have your teaching?

4. Consider classroom scenarios 1 and 2 within Module 8. How might have the teacher in Scenario 1 improved his efforts to make clarity more evident within the classroom?

5. Have a DLT, BLT or TBT discussion about instructional language—do you have a common instructional language? In order to begin to determine if you have a common language:

    a. Divide your team up into a smaller group.

    b. Within your smaller group discuss the following:

        i. What is your common instructional language? What does quality instruction look like in your district, building or grade level? Is it similar within buildings of the same grade?

        ii. Come together as a full group and talk about what effective instruction looks like (note: focus on what the quality components of instruction are, not your math or reading programs)

6. In order to more fully and deeply have a common instructional language, teachers need time to share effective instructional practices with one another. What current ways do your teachers share effective instructional practices with one another?