Assessment-Centered Teaching

Ask teachers to describe their teaching practices and most focus on the following activities they do with their students—content—often related to state standards—they want their students to learn, and instructional materials or other resources. Assessments are usually absent because assessments are mainly an afterthought to instruction (Popham, W. J. (2005). Rarely is assessment raised as a critical element of planning for instruction and the basis for instructional decisions.

Contrast the typical teacher above with our vision of the Assessment-Centered Teacher who always mentions assessment as an integral part of their teaching practice. They cannot think about instruction without considering using assessment tools and strategies to gather information about what students know. These assessments also help teachers inform their instruction by better serving their students.

The RAIM Process in Action

Assessment-Centered Teaching (ACT) combines best instructional and assessment practices. Teachers need to fully integrate their knowledge of teaching and assessment in order to implement effective instructional plans and decisions.

Just as teachers rely upon their knowledge of content, teaching strategies and instructional materials, they must also rely on quality assessment practices to plan and design sound methods of gathering information about student understanding.

Using the Conceptual Flow and RAIM process, teachers can transform their assessment practices. Prior to teaching a unit, the RAIM process helps teachers develop an assessment plan aligned with learning goals in their Conceptual Flow. Teachers identify which assessments in their instructional materials correspond with their assessment plan and analyze the quality of the assessments, deciding which needs to be kept as is, revised, deleted or developed.

The completed RAIM provides a road map for measuring student progress over time. Although a teacher can develop a RAIM individually, the process is greatly enhanced with other teachers and a facilitator. Teachers can learn so much from each other when they discuss the purpose of assessments and anticipated student responses.

The RAIM Process in Action

The RAIM process begins with a completed Conceptual Flow which identifies specific content and then maps the order of instruction. Learning goals are based on the concepts outlined on the Conceptual Flow. Completing the RAIM includes:

1. Pre-think appropriate assessment points in the Conceptual Flow.
2. Match assessments to each point identified.
3. Select and arrange assessment tasks (pre-assessment, juturc assessments and post-assessment) in an overall assessment plan which guides teachers as they monitor students’ progress.
4. Develop expected student responses for selected assessment tasks.

Pre-think Appropriate Assessment Points in the Conceptual Flow

Teachers use a pre-think to identify assessment points in their Conceptual Flow. They analyze the content chunks and consider how to embed both formative and summative assessments in relation to those chunks. Teachers first ask: What do I expect a student to produce/understand on a post or summative assessment of this unit of instruction? Then, working backward to earlier lessons in the unit, teachers ask: What knowledge should my students acquire as they work toward the learning goals of the unit? Finally, they consider: What prior knowledge do my students need to access the concepts in the unit?

During the pre-think, Assessment-Centered Teachers use sticky notes to flag where assessments should be located in their Conceptual Flow. Flags visually indicate points when the teacher needs to know what the students know (including possible alternative concepts) before continuing instruction (see Fig. 1).

Match Assessments to Each Point Identified

Next, teachers begin matching their pre-think assessment points to actual assessments found in their instructional materials.

There are three possible scenarios for any given assessment point: 1) the assessment point may be supported by an assessment in the materials, 2) the assessment point may not be supported which means teachers need to develop the assessment, or 3) the instructional materials include assessments for concepts that the teachers did not identify in their pre-think. Teachers then need to decide if these assessments should be used. Prompts in the ACT Portfolio help address each situation.
Creating Memories

**BY KATHY DIRANNA**

The brain is a powerful organ. When connections work, we are able to create and recognize things when connections fail, we are reduced to communicating in bits and pieces. But even those pieces provide an insight into the endurance of memory. And that’s built on life’s experiences. I know that first hand because my mother has Alzheimer’s disease, and we live each day looking for knowledge-centered classrooms are based on teachers knowing what is taught (subject matter), why it is taught (understanding) and what competence or mastery looks like. Learning with understanding is more difficult than memorizing and takes more time, but it’s more effective to help students make connections and build conceptual frameworks. These classrooms provide depths of study with multiple experiences. Hands-on must be minds-on.

Teachers and students use formatives assessments to monitor progress in an assessment-centered environment (see lead story). These assessments are learner-friendly and provide opportunities for students to revise and improve their thinking. Teachers use students’ work to identify student progress and gain insight on how to revise instruction to meet students’ needs. Learning has the context in which it takes place. A community-centered approach requires the development of norms for classroom and school. “Teachers must design learning experiences that promote intellectual competence and attitudes toward learning that build a sense of community…” (p. 22). Cooperation in problem solving and argumentation among students in such communities enhance cognitive development. In addition, these communities model the ways scientists work.

In this era of research-based education, let’s use the research from How People Learn. The next time you reflect on your classroom, look past the physical setup. Imagine what a visitor would observe in terms of it being a learner- knowledge- and assessment-centered classroom. Ask yourself: how intellectually rich is my environment for every student? Where are areas for improvement? More importantly, how is your environment shaping learning memories that will last a lifetime?

### RAI M PROCESS, CONTINUED FROM PAGE 1

world, however, teachers need to design an assessment plan which provides appropriate and feasible data to monitor and adjust their instruction. Here, teachers use the learning goals and the flow of concepts to select the most critical assessment points for deep analysis of student work (see Fig. 2).

**Develop Expected Student Responses (ESRs)**

With an assessment plan in place, teachers generate Expected Student Responses (ESRs) which demonstrate high, medium or low levels of understanding. Teachers write optimal student responses which demonstrate high, medium or low levels of understanding. Teachers write optimal student responses which demonstrate high, medium or low levels of understanding. Teachers write optimal student responses which demonstrate high, medium or low levels of understanding. Teachers write optimal student responses which demonstrate high, medium or low levels of understanding.

Even if scoring guides or rubrics are available in the instructional materials, it is extremely beneficial for teachers to develop ESRs. Teachers can compare their ESRs with the published scoring guides and make revisions accordingly.

**Knowledge-centered classrooms**

Knowledge-centered classrooms are based on teachers knowing what is taught (subject matter), why it is taught (understanding) and what competence or mastery looks like. Learning with understanding is more difficult than memorizing and takes more time, but it’s more effective to help students make connections and build conceptual frameworks. These classrooms provide depths of study with multiple experiences. Hands-on must be minds-on.

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### Teachers Insights

Sharing their Assessment-Centered Teaching experience, here’s what teachers had to say about the RAIM process:

- **One high school teacher discovered why many students missed almost all items on a pre-assessment — it did not reveal prior student knowledge because it contained difficult vocabulary words. When the teacher revised his assessment plan through the RAIM process, he created a new pre-assessment which was less vocabulary weighted and more accessible. The changes helped him learn what students knew about the subject and their familiarity with the vocabulary; it also provided him with more useful information for instructional planning.**
- **A middle school teacher realized she was gathering a great deal of data but was not gathering sufficient information on important concepts. She decided to create assessment items for a specific concept that would be proportional to the concept’s importance in her Conceptual Flow.**

<table>
<thead>
<tr>
<th>Concepts from Conceptual Flow</th>
<th>Pre-Assessment</th>
<th>Juncture 1</th>
<th>Juncture 2</th>
<th>Juncture 3</th>
<th>Post-Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocks and minerals have properties by which they can be described and differentiated. Quality observations are both quantitative and qualitative.</td>
<td>Rocks and have shape, size, texture, and color AND are made of ingredients called minerals.</td>
<td>Properties of hardness can be used to classify minerals.</td>
<td>Calcite can be detected with vinegar.</td>
<td>Rocks and minerals have properties by which they can be described and differentiated.</td>
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</tr>
</tbody>
</table>

**Table 1:** The RAIM Process

**Assessment Tasks**

<table>
<thead>
<tr>
<th>Narrative Item</th>
<th>Mock Rock</th>
<th>Scratch Test</th>
<th>Calcite Quest Investigation</th>
<th>Narrative Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using observations and test results, students determine if rock or mineral.</td>
<td>Use student journal entry on mock rock observations.</td>
<td>Scratch test to identify hardness.</td>
<td>Flat test to identify minerals.</td>
<td>Using observations and test results, students determine if rock or mineral.</td>
</tr>
</tbody>
</table>

**Fig. 2:** The RAIM Process

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Cadre Confessions

BY RUTH DESILVA, PAUL KILLIAN
AND ROD ZIOLKOWSKI

For the last 15 years, we have worked together as a K-12 Alliance Cadre, training elementary school teachers in pedagogy, literacy strategies and science content during summer science institutes. You may be curious why we have stayed together for so long, how we have changed, and what we have learned along the way. Here’s our story.

Paul was the first to join the K-12 Alliance when it was known as CSIN, at the program’s inception more than 20 years ago. Ruth joined a few years later and has held the full range of positions from teacher leader to staff developer; she’s currently our literacy guru. A high school science teacher, Rod joined 15 years ago to help teach science content.

Part of the reason we have been a team for so long is that we really enjoy working together. From our earliest days together, we have had fun. Over the years, we have developed a deep appreciation for each others’ strengths as our cadre roles became more defined.

Individuals, we have markedly different interests, personalities and styles. For example, Paul is a part-time third grade teacher and district science curriculum specialist for the ABC Unified School District. He knows first hand what elementary school students and teachers need and keeps our focus on those we serve.

On the other hand, Ruth reminds us about the learning process. She is the voice that says “Slow down, give students time to process, reflect and communicate.” Rod loves science, breaking Big Ideas into key pieces and then building them conceptually.

As different as we may be, we are united about one thing: We are always looking for ways to improve our craft. It is that search that has kept us together for so long. And it is that search that has driven us to write this article.

Throughout the years, we have never told the same story twice, even though we have repeated certain sets of standards. “Our classroom experiences and the K-12 Alliance have encouraged us to look through a different set of glasses every time,” says Paul.

Overall, we have gained so much from the teachers who attend our sessions. It’s very rewarding to see teachers who originally felt unprepared to teach science, develop into talented leaders and powerful teachers.

SCRUBBED UP!—Cadre members Rod Ziolkowski (from left), Paul Killian, Ruth DeSilva and Karen Cerwin celebrate a long-lasting relationship which leads medical school training.

Friendly Talk

BY KIM LUTTGEN

For the past 10 years, K-12 Alliance staff developers have been developing a comprehensive science instruction and assessment system that has been used by thousands of teachers and leaders. Last year, the system was awarded a 5-year, $7.3 million grant to be implemented in all K-12 classrooms.

One key component of the system is the Teacher Preparation Guide, which includes lesson plans and assessment tools. As part of the development process, teachers are paired with a mentor who provides feedback and support.

During one session, a teacher expressed her concerns about the quality of the materials. She noted that some of the activities were too difficult for her students and that the assessment tools were not aligned with the standards. The mentor listened carefully and suggested some modifications to the lesson plans.

In another session, a teacher shared her success story with the group. She had recently implemented a new instructional strategy and saw a significant improvement in her students’ performance on the assessment tools.

The mentor suggested that the teacher could use the assessment tools to identify areas where her students needed more support and to track their progress over time.

In summary, the Teacher Preparation Guide is an important tool for improving science instruction. However, its success depends on the support of mentors who can help teachers refine their practices and use the tools to assess student learning.
With the focus on test scores these days, it’s easy to get caught up in bragging rights if you did well on the California Standards Test (CST), or are you pulling out your hair if you did poorly. But let’s take another approach to measuring student learning: looking at real data, not just test scores. This data can indicate growth. The good news is we have the “right stuff!” Results on classroom assessment, local benchmarking and the state test correlate positively to our professional development efforts.

California Mathematics and Science Partnership (CaMSP) grants have been the impetus for this good news. These are research partnership grants that investigate how various professional development practices impact and improve student achievement. CaMSP will look at data from all projects and compare different professional development programs and determine “best practices.”

So the question is: “How are we — the K-12 Alliance — measuring up?”

Working with district and school leaders and institutes of higher education (IHE) faculty for the past three years, the K-12 Alliance has collaboratively designed and implemented quality professional development programs. These programs target improving teacher content knowledge and pedagogical practice in the service of improving student understanding and achievement.

The Data Are in

The K-12 Alliance program is currently involved in 13 MSPs from all Cohorts (1-4). Some projects target specific grade level (e.g., Palm Springs fifth grade math), others target grade spans (e.g., Tulare grades 4-8 science), and some have math and science components (e.g., Montebello and Vista). Four different evaluators have been gathering data on these projects.

The exciting consensus is that professional development is making a difference in the way teachers approach student learning. Our evaluators report gains in teacher confidence, the use of the 5-E learning cycle and appropriate questioning strategies. Evaluators also report significant changes in teacher content knowledge as seen by pre-post tests which are compared with control teachers taking the same assessment.

Student growth is measured by pre-post tests on units which incorporate content that teachers learned in the institutes. Large gains in science content knowledge were noted in grades 4-6. Many of these teachers do not have science backgrounds; the content institutes provided them with conceptual frameworks while the Teaching Learning Collaboratives (TLCs) helped them design effective lessons to build student understanding.

In study groups where teachers looked at student work, teachers noticed improvement in their students’ ability to conceptualize and communicate their scientific understanding. Teachers reported increased student competency in the investigation and experimentation realm (e.g., charting, graphing, and writing summary statements).

Just as important as numbers and data, teachers have expressed their appreciation for becoming better teachers. “My participation as a lead teacher and now as a facilitator has had a positive influence on my teaching ability,” said Laura Vorbal, a fourth grade teacher in Tulare who has seen an increase in her students’ scores on the CST.

“We using the conceptual flow model first in science and then in other academic areas has had a positive impact on my student’s learning. My students are pre-dominantly second language learners and have made significant gains on standardized testing. I believe this is a direct result of my participation in summer institutes and TLCs. I continue to become a better educator because of this collaborative experience.”

Cause for Applause

Overall, districts are celebrating increase scores on fifth grade CST.

For example, after just one year of participation, Marysville proficient scores went from only 5 percent of the students to 23 percent. Below basic and far below basic decreased from 60 percent to 32 percent! Take note: almost every fourth and fifth grade teacher is involved in the MSP project.

Similar results were obtained for schools in Tulare that had increases from 3 percent to 26 percent proficient and a corresponding decrease in the below basic and far below basic categories.

Coaches reviewed its scores by looking at different science strands at fourth and fifth grades. These percentages reflect the average percent of correct answers in each of the strands. Over three years, improvement has been made in all three disciplines (see Fig. 1).

K-12 Alliance participants often credited the K-12 Alliance as the catalyst that changed their teaching. They continually comment on how much work it is to teach for learning but overall, it’s worth it in the end. Now, we have the data to show it!

From multiple measures of teacher practice and student understanding, we know that the quality we demand causes the results we want. When asked “How are we measuring up?” we can proudly answer, “We are measuring up quite well!”

In the next issue of What’s the Big Idea?, we will examine how to develop scoring guides and analyze patterns in student work to inform instruction.