

Using SEC data to improve curriculum content alignment in Oregon's Canyon Falls¹ School District: Initial steps and evolving challenges

Eric Osthoff, Ph.D.

Wisconsin Center for Education Research

Consultant to CCSSO SEC Collaborative

February 19, 2007

Introduction

Oregon's Canyon Falls school district began attracting attention in 2005 for two reasons. One, it was posting big gains in meeting NCLB requirements.² Two, the district was pursuing new strategies for improving instructional planning and thereby bolstering the efficacy of classroom instruction itself. This article explores on-going efforts in Canyon Falls to enact best practices for instructional improvement planning.

Canyon Falls' strategy for improving teaching and learning has been multi-faceted. In this article the focus is on one part of the broader strategy—increasing the alignment of instruction in district classrooms to state and national standards.³ An important tool used by Canyon Falls administrators and teachers to understand what alignment is, where it is high or low, and how to improve it, is the Surveys of Enacted Curriculum (SEC).⁴

The purpose of the article is two-fold. The first is to share how Canyon Falls has used the SEC over several years as part of a broader district strategy for improving standards-based teaching and learning. This includes describing how focusing on alignment has affected concrete organizational and instructional practices (e.g., student grouping, textbook selection, and changes in instructional content emphasis by course and grade level). It also involves discussion of the implications of such changes in practice for the alignment of instruction to state and national standards as well as to state assessments.

The second purpose is to help others interested in the SEC see how they might use the instrument and data in their own instructional alignment efforts. This is done by exploring possible relationships between instructional improvement actions taken in Canyon Falls to SEC data reported by district teachers over a period of three years. Such exploration provides educators who may be looking for tools for data-informed instructional improvement with a window on strategies others have used.

Big “take-aways” from Canyon Falls include:

- Using data to improve curriculum alignment district-wide requires working coherently at all levels of the system: the classroom, grade, school, and district level.
- Changing instructional practice at the level of individual teachers requires supportive changes in organizational structure and culture.
- In responding to the NCLB challenge to produce continuously rising and more equitable student achievement, districts, schools and teachers will need to use data much more extensively and systematically than ever before to guide professional practice and instructional planning at all levels. State Education Agencies, the *SEC State Collaborative*⁵, State and Regional Educational Service Agencies, and other technical assistance providers must substantially augment the technical capacity, resources, and

leadership brought to bear to help K-12 educators productively identify the types of data they most urgently require, then use the data strategically and effectively to modify and improve instructional practice.

There are no step-by-step instructions for instructional improvement. Instructional leaders in Canyon Falls have properly taken a long-term view of the process and see theirs as a work in progress. Their story is instructive not only in areas where they have made progress, but also for the way in which their willingness to take risks and engage with data has pointed to potentially fruitful further steps. By exploring SEC data in the context of an on-going district instructional improvement effort this article is intended to help teachers understand how SEC data can help address instructional alignment challenges, and help administrators identify strategies for fostering and supporting effective use of instructional content data by individual teachers, grade level teams, school site teams, and district teams working toward instructional improvement.

Organization of the article

Before turning to the Canyon Falls experience it is necessary to understand generally how the SEC measures and describes alignment. It is furthermore essential to understand both why alignment is so critical to standards-based instructional improvement, and why alignment alone is not the whole story.

When turning to Canyon Falls the first topic up will be background on how the district began using the SEC as part of a broader strategy for improving teaching and student learning in a standards-based environment is discussed first. Then the article looks at changes in instructional policy and practice made at the district, school, and classroom level. Consideration is given to how changes in policy and practice came through in the content of instruction at each level of the system as measured by the SEC. The focus is especially on understanding how alignment of instruction at the district, school, and classroom levels changed in relation to state and national standards as well as the standards-based state assessment.

What are the Surveys of Enacted Curriculum, what do they tell us about alignment, and why is alignment important?

The Surveys of Enacted Curriculum is actually a suite of tools designed to describe and measure alignment among various facets of the curriculum. Currently the tools provide a consistent way to describe and quantify the academic content of standards, assessments, and classroom instruction.⁶ At the heart of the method is a set of subject-specific content taxonomies. Each taxonomy is conceived as a matrix in which subject area *topics* are listed on the vertical dimension and *student expectations* are listed on the horizontal.

For example, one topic in the mathematics taxonomy is “*Add, subtract fractions*”. Teachers can and do instruct students on how to add or subtract fractions relative to a range of student expectations; that is, intended outcomes as to what students will know about fractions and be able to do with them. The SEC taxonomy divides instruction on a topic such as fractions into five distinct categories of *student expectations*:

- Recall/Memorize Facts/Definitions/Formulas.
- Perform procedures (e.g., Do computational procedures or algorithms; Solve equations/formulas/routine word problems).

- Demonstrate Understanding of Mathematical Ideas (e.g., Develop/explain relationship between concepts).
- Conjecture/Generalize/Prove (e.g., Recognize, generate, or create patterns; Make and investigate mathematical conjectures).
- Solve Non-routine Problems/Make connections. (e.g., Apply and adapt a variety of appropriate strategies to solve non-routine problems).

One can question whether these particular student expectation categories are definitive, though they incorporate much of knowledge about teaching and learning from decades of research and practice. What is indisputable is that student expectations are integral to concrete instructional practice and that it is impossible to teach fractions or any other topic without involving one or more student expectation. That is why, in the *SEC* approach, content always includes topics *and* student expectations.

Does defining content to include both student expectations and topics really matter to teaching and learning on the ground? Most teachers recognize intuitively that there are in fact many ways to engage students in a given topic and that what students take away from instruction depends on teacher decisions. It is one thing to ask a student to memorize that $\frac{1}{2} + \frac{1}{2} = 1$, and $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$. But it is altogether different to ask a child to explain conceptually why that is so, including what exactly is meant by the fraction $\frac{1}{2}$, or why combining two parts of things sometimes makes a whole and sometimes does not.

Research has provided strong support for teachers' intuitive sense of the import of the student expectation dimension of content. For example, in one study Algebra I students were given a pre- and post-test to measure achievement gains, and teachers reported on their content coverage using the Surveys of Enacted Curriculum.⁷ Researchers then used quantitative methods to account for student achievement using three pieces of information: (1) Teachers' emphasis of the various student expectations, (2) Teachers' emphasis of mathematics topics, and (3) Teachers' emphasis of content as defined by topic-student expectation combinations.

Researchers found that knowing the extent to which teachers emphasized the various student expectation categories explained only 7 percent of the variation in student achievement gains. Topic coverage explained 15 percent of the gains. When researchers used both types of information simultaneously—topics combined with student expectations—it explained 31 percent of the variation in student achievement gains. In other words, approximately 1/3 of the variation in student learning gains came down to whether teachers had attempted to engage students in topics covered on the test and do so with student expectations that were well matched or *aligned* to the expectations emphasized by the test. Teachers ignore alignment of instruction to standards and standards-aligned assessments at great risk to student achievement.

If topic-expectation combinations explain something on the order of one-third of the variation in student achievement gains, then what accounts for the other two-thirds? Multiple factors combine to explain student achievement in its entirety. Among them, instructional quality warrants special consideration.

Instructional quality can be defined in many ways, but whatever it is, it has a very special relationship to content alignment in a standards-based world. Covering the right topic-expectation combinations in the right proportions doesn't produce student achievement if students are off-task and teachers lack pedagogical knowledge and skills needed to foster student

understanding. Similarly, even a teacher who succeeds at enabling children to understand all content presented is going to falter in producing student achievement if the content the teacher covers is out of sync with the content of state standards and standards-based assessments.

An alignment tool such as the *SEC* will never tell teachers precisely what to do to improve the quality of instruction, but it does provide teachers with two very important pieces of the instructional improvement puzzle. First, as discussed above, the *SEC* can tell teachers if they are teaching a lot of content that is simply ‘off the map’ such that much of the achievement they are fostering is in areas simply not measured by assessments. Second, when teachers focus on content that is aligned to standards and assessments and students still fall short, it suggests the key to improvement is changes in how the content is being presented. So although instructional alignment data may not tell teachers exactly what to do to improve student learning, it does help in identifying situations where the instructional approach to the topic needs more attention.

In addition to alignment and instructional quality, motivation plays an important role in student achievement. Motivating students themselves to value the instructional content they are offered and to do their best on assessments is obviously important and something many schools already address. What receives less systematic attention in schools and districts, and is critical in a standards-based environment, is the motivation of teachers to continuously monitor their practice and modify it when necessary to function as part of a larger system in which coordination across grade levels at the state, district and school level assures all students access to important content.

Optimizing teacher motivation requires at least two things. One, teachers must have access to appropriate data to determine how their students are doing and how student success relates to instructional considerations such as content covered. Two, teachers must believe there is a reasonable chance of success if they set out to change instruction. Successful instructional leaders pay careful attention to how organizational culture and administrative practice affects these two dimensions of teacher motivation. Examples of this will be evident in discussion of the Canyon Falls work.

How do SEC tools depict content and define alignment?

To follow the Canyon Falls story one must be able to read *SEC* content displays, including the nature of the raw data behind *SEC* alignment indicators. The series of figures below presents three related *SEC* content maps.⁸

Figure 1a, on the left, shows the Grade 8 Oregon Standards in relation to the gamut of topic-expectation combinations.⁹ Listed down the right side of the map are seven broad content areas that encompass essentially all K-8 mathematics content.¹⁰ Across the bottom are student expectation categories. The graphic is read like a topographical map. Intersections that land in the white space are ones that get very little or no emphasis in the standards. Content area-expectation combinations that land in a colored area are emphasized at the level associated with that color in the legend. In this map darker colors represent greater emphasis. In Figure 1a, three content area-expectation combinations are emphasized most. These include performing procedures with the content areas of (1) *Number Sense / Properties / Relationships*, (2) *Algebraic Concepts*, and (3) *Geometric Concepts*. Each domain accounts for approximately 10% of the content targeted by Oregon Grade 8 math standards.

Figure 1a (left), 1b (right), and 1c (bottom)



Mathematics Content

Oregon

Percentage of Overall Mathematics Instructional Time

Alignment re-centered: 0.47

Administration Year: 2006

Viewing: OR Stnd (2004) Gr. 8 Data

Data Cut: All Data

Count: 1

Administration Year: 2005

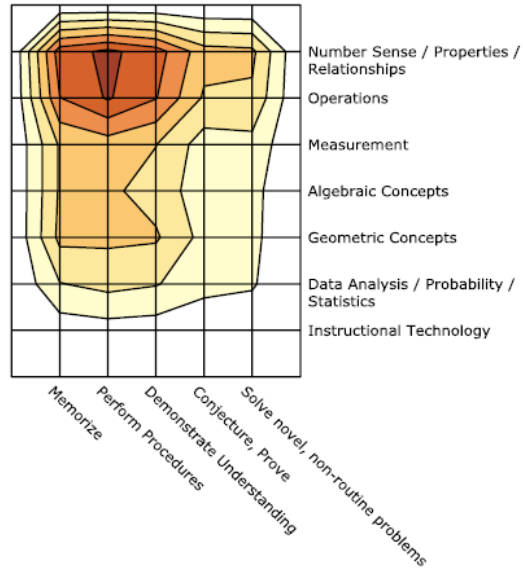
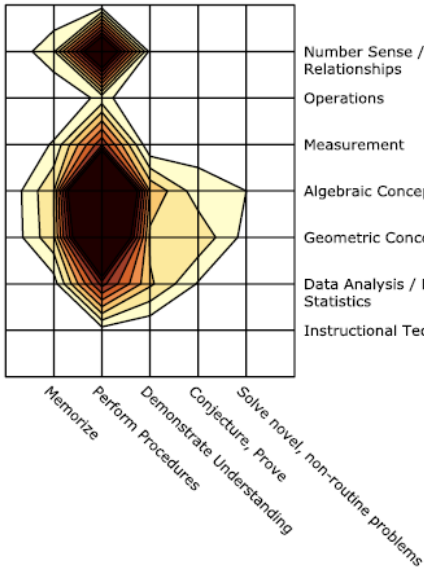
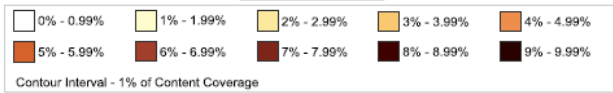
Viewing: State Data - Oregon

Data Cut: Middle School Math

Count: 32



Update Map!



Administration Year: 2006

Viewing: State Data - Oregon

Data Cut: Middle School Math

Count: 54

Alignment re-centered: 0.50

Note: The SEC online report generator allows users to enlarge images for easier viewing.

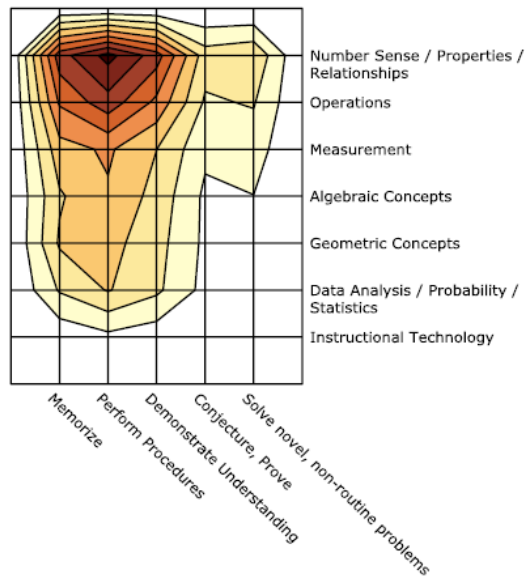


Figure 1b shows aggregated data for instructional content as reported by a non-representative sample consisting of the 32 Oregon middle school mathematics teachers who completed the SEC survey in 2005. Compared to the Grade 8 standards, this group of middle school teachers spread their instructional time more evenly over a larger number of content area-expectation combinations.

A great advantage to mapping out standards and instructional content using the SEC taxonomy is that it provides a standardized procedure for determining the degree of similarity—or *alignment*—between any two SEC maps. The SEC alignment index runs from 0 to 1, where 0 represents no overlap whatsoever between two maps, and 1 represents identical emphasis for all content area-expectation combinations in both maps. The alignment between Figures 1a and 1b is .47.

Equipped with baseline data one can ask whether or not classroom instructional content is becoming more aligned to standards over time. Figure 1c shows aggregated instructional content data for the 54 Oregon middle school mathematics teachers who completed the SEC survey in 2006. The alignment of this group to the Grade 8 standards is .50—an increase of .03 over a one year period of time. This illustrates an alignment indicator going in the right direction, though one must be cautious about forming conclusions from this data because it involves a small sample that may not be representative of middle school math teachers in the state as a whole.

A time of transition for state and district standards-based instruction and instructional leadership

In 2002, Canyon Falls was at a cross roads. All district schools had failed to make AYP. The then newly legislated NCLB promised steadily rising targets, and this as the proportion of English Language Learners was rapidly climbing. Add to that the fact that the state was instituting new, challenging standards and the need for retooling was clear.

Taking stock in where the district needed to go instructionally Canyon Falls administrators contacted the Oregon Department of Education (ODE) Mathematics Specialist. The timing was good. ODE leaders had been developing new instructional improvement frameworks to guide schools and districts. ODE staff had also been building their own knowledge about and capacity to support teacher, principal, and district administrator use of new tools for instructional improvement planning.

Over a series of meetings the state specialist and Canyon Falls teachers and administrators explored new models for fostering coherent district-wide instructional improvement. The group quickly converged on three main themes; increased use of data, alignment, and shared leadership.

As to data-informed instructional practice and improvement, the state had implemented a new Consolidated Improvement Planning process (CIP) that required substantial research-based use of data in district and school improvement plans. This dove-tailed with the belief of district administrators that greater use of data would help ensure steadily rising student achievement.

On the alignment front, the state specialist, who had then recently begun participating in the SEC State Collaborative, coordinated by the Council of Chief State School Officers, offered up an opportunity to pilot the Surveys of Enacted Curriculum with approximately 60 teachers as a way

to get baseline data on how instruction in the district aligned with new state standards then coming on line. Teachers were to begin implementing the new standards in 2002-03, with new state tests aligned to the standards planned for 2003-04. The Surveys of Enacted Curriculum would provide district leaders with information about the alignment of instruction to the new state standards. According to a district administrator:

What excited me the most when I first heard about [the SEC] was that we were going to be [asking] teachers what they actually taught. I was a lot more interested in [what they were actually teaching] than what they planned to teach. Because a lot of people can put down what they plan to teach in lesson plans and then go back and teach what they want to teach....An exciting thing about [the SEC] is it has really made teachers rethink accountability and what they're doing.... If they know they're being surveyed [with the SEC and our district electronic curriculum mapping tool] on what they actually taught, that accountability has really made them rethink some of the things they were doing. It has helped them to focus on the standards at hand.

The third and boldest change undertaken by the district consisted of a plan for increasing shared leadership for instructional improvement planning. The decision to pursue shared decision-making was driven as much by pragmatic as philosophical considerations. The state specialist presented district administrators with information about "data-driven" instructional improvement activities in other districts throughout Oregon and the nation, arguing that teachers needed to be engaged in and making concrete sense of data to be moved by it. It would not be powerful to have a few district administrators sift through data and make pronouncements on it's implications for classroom instruction.

The group realized that engaging people in new roles and activities would require a change in organizational structure. They considered a range of models for fostering shared, data-informed decision-making. Ultimately they settled on a structure consisting of a three-tiered network of grade level curriculum teams, school curriculum councils, and a district-wide curriculum cabinet. The curriculum cabinet included district administrators, teachers, as well as a school board member who was especially committed to involving teachers in data-informed, shared decision-making. School curriculum councils included teachers from each grade level and the school principal.

A district administrator explained that the curriculum cabinet's purpose was to surface and clarify questions, not to impose top-down control of the instructional improvement process. Likewise, teachers, through team-level engagement with data, would surface questions to be passed on to school councils and the cabinet for broader consideration. This would allow the cabinet to identify district-wide issues and bring to bear additional data and technical assistance not readily available to schools or grade level teams. Thus the relationship among teams, councils, and the cabinet was seen to be interactive and non-hierarchical. The joint work was to be characterized by dialogue, not a one-way flow of information and directives.

The following excerpt from a district administrator interview relates the vision for using SEC and other data as part of the district's on-going instructional improvement work as well as acknowledging the reality of how difficult and painstaking it can be for people at all levels of the district to fully engage and become proficient with new approaches.

The council has access to all the state assessment data. That includes strand data for each subject area.....Say they want to look at [the geometry strand of mathematics], which we are focusing on. That's been a weaker strand in the past and is one we're paying attention to. Saxon didn't have geometry at all, so it was a real weak strand when we used that series. So the council wants to see how that's going and they look at that stand. Say a team is working on the fourth grade. They pull up that grade level and look at the state assessment data for the geometry strand and see that the test scores are very low. [Then imagine they look across the grades and see they are all low on the geometry strand]. They say, 'We're going to suspend judgment, we're not going to point fingers, but let's do some further research. Let's create some questions about why the [low scores] might have happened.' They'll say, 'Let's look at the SEC data. Let's see what happened there. For the fourth grade teachers, let's see how they responded the previous spring on the SEC.' They find out there's a pattern where they're teaching geometry less than they probably should. So there's a second data point that helps validate why we are researching that area. Then they go to the electronic curriculum mapping tool (Author's note: This tool, which is different from the SEC, is discussed later) and they look at the year long curriculum for fourth grade. They analyze how much geometry was offered at the 4th grade level. If they see it is also low there, then they have three data points. That is pretty powerful...They give that information both to the curriculum cabinet—which is the decision making cabinet for the district, with teachers and a couple administrators—and the building principals with fourth grades in their building. The building principals would then share the report with the teachers. The report is a list of questions they have. Why would our test scores be a little lower in the geometry strand than others? Then the school teams would get the information and their job would be to continue researching and raise more questions. That's the environment we're trying to create. We don't want to be quick to jumping to solutions. We're trying to make sure we investigate very thoroughly and come back with a professional development plan of how to address those concerns.

...We're still evolving with the [part related to the school addressing and responding to the questions sent from the council.] The last part has not happened yet. We have sent reports to the building, but we haven't evolved to the point where we've clarified what is going to happen.... We've created a lot of dialogue in the buildings, with the council and the cabinet. So you have a lot of vertical dialogue happening that we never had before. A lot of 'ahas' have come out of this. I don't mind going slow through this because we're still getting a lot of learning happening with our district....[The ultimate goal is for teams to ask] 'What further data do we need to pin point what we need to do?' Then they could ask the council, 'Could you analyze such and such data to help us pin point the problem?' Or they can go to their administrator and say, 'We're getting close to where we think some problems are. Could we work together on some professional development, some training?' We want teachers to target areas very specifically....with the training they need.

The need for non-hierarchical dialogue as a basis for productive engagement was something the state specialist brought to the table based upon her knowledge of models being used nationally to foster data use for instructional improvement, including the approach presented by Nancy Love

in *Using Data/Getting Results: A Practical Guide for School Improvement in Mathematics and Science*.¹¹ Through the SEC Collaborative, the state specialist had networked with Diana Nunnaley, of TERC, where *Using Data/Getting Results* had been produced and was used extensively by professional developers such as Nunnaley to foster school- and teacher-level use of SEC and other data for instructional improvement.¹²

According to the state specialist, “Once the group agreed on getting teachers really involved in data and shared-decision-making the district leader [charged with oversight of the work] threw down the gauntlet. He said, ‘If we’re going to do this we have to find a way to give teachers time to dig into and use the data’.” Consequently, a supportive school board member was invited to join the group at their next meeting. The board member agreed to become part of the curriculum cabinet and to advocate with the rest of the board for policies and resources needed to sustain teacher involvement in the work. At the end of the 2002-03 school year the board approved a policy giving teachers 90 minutes per month of release time to explore and discuss data. This would seed the process of engaging teachers in a district-wide conversation about instructional improvement by giving them time to articulate issues and questions to be passed on to the district curriculum cabinet through their school curriculum council.

To summarize the preceding, Canyon Falls administrators, faced with underperforming students and a changing state and national curriculum policy and accountability environment, reevaluated their own organization’s approach to on-going instructional improvement efforts. Having selected a strategy that featured increased data use, curriculum alignment, and shared leadership, the group proceeded to modify their organizational model to accommodate the expanded role for teachers in data-informed decision-making. The group then recognized that the new models and practices they envisioned would require additional concrete changes for the effort to be more than symbolic. First, the district would need to buy teacher release time to afford teachers significant opportunities to explore and reflect on data in the context of their own classrooms and schools. Second, the district would need to tap into external agencies to get tools and technical assistance needed to increase the capacity of all district personnel to enter productively into data-informed instructional improvement.

The decision to fund teacher release time to foster new professional practice in the district was just the first of several concrete changes that followed from the district’s commitment to data-informed instructional improvement. Other such changes are described below. Then the discussion moves to examples of how the SEC data might be used to look for possible effects of instructional improvement activities on the alignment of instructional content to standards and assessments at the district, school, and classroom level.

Pathways to alignment and achievement

This article began with discussion of the nature of alignment and its relationship to student achievement. Below are several common pathways used by districts, schools, and teachers to improve alignment, followed by an overview of such policies and practices in Canyon Falls.

Basic strategies for increasing the alignment of instructional content to state standards or similar targets include:

1. Change course offerings
2. Change the placement of students in courses
3. Change the content within a course

The third strategy is perhaps the most intuitive. A teacher sees that she is emphasizing one or more dimensions of content to a much greater or lesser degree than the standards and makes adjustments to hew closer to the target curriculum. This is one of few meaningful ways teachers can contribute to grade-, school-, or district-level alignment regardless of what is being done by other teachers or administrators. It is worth noting that teachers may be more motivated to go to the trouble to change course content in a district where there is a full-court press to shore up alignment by pursuing all three major strategies simultaneously.

Change strategies 1 and 2 require collective action at the team, school, and district level. Change strategy 1 improves alignment if new courses are relatively highly aligned to the target, or if curtailed courses are relatively poorly aligned.

Change strategy 3 improves alignment if the proportion of students assigned to relatively poorly aligned courses is reduced while assignment to relatively well-aligned courses is increased.

Change strategy 3 can be pursued by itself, or it can follow from strategy 2. For either strategy to succeed teachers must maintain the rigor of course content as students who had previously been assigned to less rigorous courses are shifted into better-aligned offerings. For some teachers this requires expanded knowledge of pedagogical approaches better suited to the learning needs of their evolving client base. Also, as poorly aligned courses are eliminated at the upper grade levels, teachers at lower grade levels need to understand the new target in terms of what their students need to know and be able to do to succeed in the changing environment of higher grade levels. This means collective action is needed beyond changes in course offerings or student programming. School and district support for well-aligned teacher professional development and cross-grade planning is also integral to success.

Canyon Falls change strategies

As noted Canyon Falls has opted for a multi-faceted approach to instructional improvement. In the context of a sustained conversation involving the curriculum cabinet, councils, and teams, Canyon Falls has implemented or adopted concrete changes related to all three alignment strategies.

As the district began focusing intently on curriculum alignment, mathematics teacher teams at the middle and high school level recognized that they were offering some extremely low-level courses with little potential to give students access to content aligned to grade-level standards. A high school course in remedial middle school math and a middle school course in remedial elementary math were eliminated.

A second structural issue they addressed was the long-standing practice of student tracking. Historically all but one of the district's schools had a program based on 4 or 5 track levels. Deliberations resulted in a goal of reducing if not phasing out tracking over a period of time. Initially all schools would have 1-2 years to plan for and implement a reduction in the number of tracks to no more than three.¹³

Several concrete changes have been made that have the potential to increase the alignment of the content of particular courses to standards or other targets. One change was to institute a policy whereby only teachers certified in mathematics would instruct English language learners in the

middle and high school. This is a potentially important way for the district to upgrade student access to standards-based math content given that approximately 35% of district students were classified as Limited English Proficient in 2004-05.

Another change with major potential implications for alignment was district adoption of new mathematics textbooks. The district had been using the Saxon math series which had been dropped from the state adoption list. At the high school level the selection of a new text was directly affected by teachers having completed SEC surveys. One math teacher who was especially intrigued with alignment delved into SEC data pertaining to grade level standards and compared state targets with the content emphasized by their then current and possible future texts. This inquiry revealed that the Saxon series placed little emphasis on state standards for Geometry, as well as Probability and Statistics. In contrast, texts on the state list tended to be much more in line with state standards in these and other mathematics content areas.

In conjunction with a shift to new texts, high school math teachers reflected on the relatively heavy emphasis on geometry in the state standards. Traditionally the district program had been structured so that students studied geometry little prior to completing Pre-Algebra and Algebra. Unfortunately, many lower-track students tended to end their mathematics coursework upon completing Pre-Algebra and Algebra. The high school math department decided to respond by infusing significant geometry content into the two courses.

One other concrete tool introduced to foster alignment was an electronic curriculum mapping tool. The curriculum mapping tool, developed and deployed in collaboration with the district's local education service district, had qualities that might allow it to complement the SEC tool and data. For example, whereas the SEC has typically been administered once annually, the district's curriculum mapping tool was updated monthly by teachers. This included recording the content they planned to cover in the upcoming month as well as reflections on the extent to which they had actually covered the content they had targeted in the preceding month's plan.¹⁴

Using SEC data to track changes in alignment and effects of changes in classroom, school, and district policies and practices on alignment

The changes described above represent structural changes intended to increase student access to standards-based content. However, ultimately, the content that students learn depends not on the intended curriculum of policies, textbooks, and instructional plans, but upon the content of the curriculum as enacted by teachers in classrooms. Whereas structural changes happen at once, teachers make decisions minute by minute about what to teach, how to teach it, and to whom to teach it. That's where the SEC tool comes in by providing a picture of one or more teachers' enacted curriculum over the sweep of entire courses. By availing themselves of the SEC survey and SEOnline data, teachers may compare the curricula they enact to targets such as their state standards. Those who complete the survey two or more times, as many Canyon Falls mathematics teachers have, may track trends in their enacted curriculum. The remainder of this article looks at illustrative district-, school-, grade-, and classroom-level SEC data from Canyon Falls.

District- and school-level SEC data

This section focuses upon exploring district-level data. However, the same logic and techniques apply to utilizing SEC data to understand school-level content patterns and trends.

The SEOnline report generator supports two different methods for exploring district- or school-level alignment. The first is to do a series of grade-level analyses, then synthesize the information. Grade levels must be examined separately because each has a unique content target. The district-level data needed for such analysis can be retrieved by anyone from the district who has a SEC User ID and password.

A second way to analyze district-level alignment is to compare the alignment of individual teachers to their appropriate grade-level target, then look for patterns across teachers. For example, with several years of data for numerous teachers, one may ask, does the alignment of individual teachers tend to rise or fall over time against state grade-level standards?¹⁵

From 2004 to 2006, Canyon Falls teachers in Kindergarten through Grade 10 completed 166 SEC surveys. Of these, 111 surveys were completed by a subset of 42 teachers who took the survey in two or three consecutive years. We can look at the data of these 42 teachers to assess district-level alignment trends. Below each teacher is compared to 3 distinct targets: (1) their grade level state standard; (2) the NCTM standards for their grade band, and (3) their grade level state assessment.¹⁶ Table 1 shows how much the alignment of the instructional content reported by each teacher over a 2 or 3 year period increased or decreased relative to each target. For example, over 3 years the alignment of Teacher 1's enacted curriculum to his or her state grade-level standards rose by .19. This would represent substantial improvement in alignment given that the alignment index ranges from zero to one.

Table 1: Changes in alignment of enacted instructional mathematics content relative to state and national standards, and state assessments for 42 Canyon Falls teachers over 2 to 3 years.

Teacher	Oregon Standard	NCTM Standards	Oregon Assessment
1	19	5	16
2	17	-2	-4
3	16	-1	7
4	15	15	12
5	13	17	9
6	12	-4	10
7	7	5	6
8	7	12	6
9	7	10	4
10	6	3	3
11	6	5	5
12	6	8	6
13	6	15	5
14	5	1	6
15	5	1	6
16	4	5	1
17	4	5	5
18	3	4	12
19	3	3	2
20	3	3	-1
21	3	4	-1
22	2	-2	-5
23	1	3	4
24	1	3	5
25	1	8	3
26	0	2	-1
27	0	10	0
28	0	0	3
29	-1	0	6
30	-1	1	2
31	-1	-4	9
32	-1	0	0
33	-2	2	0
34	-2	9	-8
35	-2	-1	-3
36	-2	1	-3
37	-2	0	-1
38	-3	-3	-3
39	-3	3	-5
40	-6	-5	-4
41	-6	-8	-6
42	-11	-10	-9
Average Change (Absolute value)	5.119	4.833	4.929
Std. Dev. Change	6.437	5.833	5.630

Four interesting patterns in the data are identified and discussed below:

Pattern A: 24 of the 42 teachers rose or fell against all 3 indicators. Of the 24, 19 rose on all 3 indicators; 5 declined against all 3.

Pattern B: 18 teachers changed in ways that produced mixed results (e.g., 4 teachers improved their alignment to standards while declining in their alignment to the state test; 3 teachers declined in their alignment to the state standards while rising relative to the state test.)

Discussion. A majority of Canyon Falls math teachers changed their instruction so as to converge simultaneously on all three content targets. It is a simple fact that less than perfect alignment between state standards, national standards, and state assessments means there is a point where content changes that bring a teacher closer to one target will necessarily move them away from another target. However, it appears most teachers in Canyon Falls need not worry about confronting this delicate balancing act in the absence of substantial further changes to instructional content. The median alignment index of instructional content to grade level standards for teachers in the sample was .30. Of the 22 teachers with an alignment index of .30 or greater, 14 saw their alignment rise against all three targets. Only 5 of the 20 teachers with relatively low alignment to the state standards saw their alignment to all three targets rise during the same period.

Pattern C: 12 teachers increased their alignment to state standards more than they increased their alignment to the NCTM standards.

Pattern D: 25 teachers increased their alignment to the NCTM standards more than they improved alignment against their state grade-level standards (or fell less against the NCTM than state standards.)

Discussion. The data suggest that something changed in Canyon Falls to make the national standards an increasingly salient target for instruction and the state standards somewhat less so. As noted earlier in the article, Canyon Falls implemented a change in math textbooks at the same time it began using the SEC. It appears the change in textbooks was associated with a bump in alignment to the state standards, but an even bigger bump in alignment to the NCTM standards. If this is true, then it is important to know because the benefits of structural changes such as new texts may produce a one-time bump and not by themselves lead to continuously rising alignment. To keep alignment rising continuously in such situations requires additional actions.

To confirm that implementing new textbooks has resulted in making national instead of state standards the primary target for most Canyon Falls math teachers would require further investigating at least two questions. First, is the text series now used in Canyon Falls more aligned to the NCTM standards than Oregon's state content standards? This would likely be true of many texts since they are designed for a national market, not customized to the needs of a single state—especially a single state that represents a relatively small share of the national textbook market.

Second, do teachers largely follow texts or use them selectively? If Canyon Falls teachers have been following texts closely it would support the hypothesis that texts are in fact pointing

instruction more toward national than state standards. If it turned out that teachers follow texts only loosely, then it would suggest something other than, or in addition to textbooks is focusing teachers more on national than state content standards.

Exploring such matters could be important to further aligning math content to state standards in the district. If it turned out that the texts are not highly aligned with state standards and that teachers basically stick to the texts, then further improving alignment to state standards would require changes in text usage. For example, it might require that teachers use textbooks more as a resource and treat it less as the curriculum per se. This would entail determining where texts over- or under-emphasize content relative to state standards and making appropriate adjustments.

Only further inquiry can show whether this is an area Canyon Falls would benefit from working on intensely. However, looking at this issue from a state perspective, it is all but certain that there are teachers, schools, and districts where improving alignment to state standards will be optimized only by carefully determining when to lean heavily on texts as they are, when to use them with adaptations, and when to turn heavily to supplementary materials or change texts entirely.

As noted above the same logic can be used to delve into district-level SEC data applies to exploring school-level instructional content patterns. The important thing is to match grade-level or grade-level band content data to comparable grade-level targets.

Grade- and classroom-level SEC data

The focus in this section is upon instructional content at one grade level in a single Canyon Falls school for two consecutive school years. Just as the same method works in using SEC data to do district- and school-level analysis, the same approaches used for grade-level analysis apply to classroom-level data.

Figure 2a shows a tile chart¹⁷ of the Oregon Grade 5 mathematics standards. Figure 2b is a similar chart showing aggregated instructional content for a group of Grade 5 teachers completing the SEC survey in a district school in School Year 2004-05. Figure 2c shows aggregated instructional content data for all Grade 5 math survey completers in the school for School Year 2005-06.

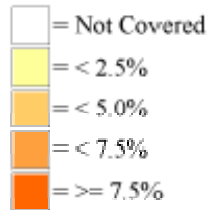
The content coverage patterns exhibited by this group of teachers have characteristics commonly seen in other grade level teams in their school, district, state, and beyond.

Figures 2a (top-center), 2b (top-right), and 2c (bottom-right): Coarse grain mathematics content emphasis and alignment for the Oregon Grade 5 standards, and the enacted curriculum of a Grade 5 team in SY 2004-05, and SY 2005-06.

Mathematics Content

Oregon

Percentage of Overall Mathematics Instructional Time



Alignment Re-centered: 0.5093

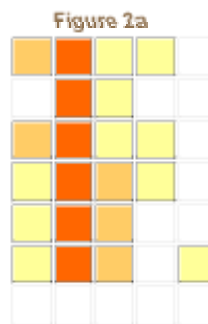
Administration Year: 2006 2005
Sample Selection: OR Stnd (02) Gr. 5 X Elementary School
Report By: All Data Grade 5

Show Data Tables

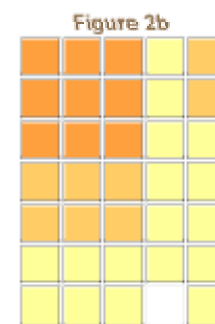
- Number Sense / Properties / Relationships
- Operations
- Measurement
- Algebraic Concepts
- Geometric Concepts
- Data Analysis / Probability / Statistics
- Instructional Technology

Student Expectations

- I. Memorize
- II. Perform Procedures
- III. Demonstrate Understanding
- IV. Conjecture, Prove
- V. Solve novel, non-routine problems



- I.
- II.
- III.
- IV.
- V.



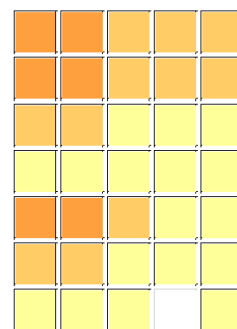
- I.
- II.
- III.
- IV.
- V.

- Number Sense / Properties / Relationships
- Operations
- Measurement
- Algebraic Concepts
- Geometric Concepts
- Data Analysis / Probability / Statistics
- Instructional Technology

Student Expectations

- I. Memorize
- II. Perform Procedures
- III. Demonstrate Understanding
- IV. Conjecture, Prove
- V. Solve novel, non-routine problems

Figure 2c
X Elementary School
Grade 5: 2006



Alignment (to OR Grade 5 Standards) Re-centered: 0.4837

- I.
- II.
- III.
- IV.
- V.

The “Alignment re-centered” index shows a slight decline in alignment between Grade 5 mathematics instruction in the school shown here and the state Grade 5 mathematics standards, going to 0.4837 in 2006 from 0.5093 in 2005. Comparing the charts in Figures 2b and 2c shows how this group of teachers changed their enacted curriculum from one year to the next. For example, from 2005 to 2006 these teachers as a group reduced emphasis on the first three student expectations categories (i.e., *Memorize*, *Perform Procedures*, and *Demonstrate Understanding*) in the *Algebraic Concepts* area. During this same period they increased emphasis on the first two categories of student expectations in the *Data Analysis / Probability / Statistics* area.

Coarse grain maps and charts are good for spotting general trends in content and alignment, but they are limited because they aggregate data for all topics in the content area. The limitations of coarse grain SEC data become clear by drilling one layer deeper into the SEC report generator and data set—into the “fine grain” data that underlies the coarse grain. It is the fine grain data that most powerfully informs instructional decision-making at the classroom level and best predicts student achievement.

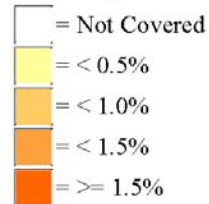
The series of tile charts presented in Figures 3a-3c is similar to the one in Figures 2a-2c. The difference is that Figures 3a-3c show fine grain tile charts displaying the distribution of content emphasis by topic-student expectation combinations within the larger *Data Analysis / Probability / Statistics* content area. Figure 3a shows the emphasis pattern for the *Data Analysis / Probability / Statistics* content area for the Oregon Grade 5 standards. Figures 3b and 3c show enacted curriculum of the same group of Grade 5 teachers for the *Data Analysis / Probability / Statistics* content area for School Years 2004-05 and 2005-06.

Figure 3a (Grade 5 OR Standards: Data Analysis / Probability / Statistics) and Figure 3b (Enacted curriculum for 2005 for Grade 5 teachers in a Canyon Falls school).

Mathematics Content: Data Analysis / Probability / Statistics

Oregon

Percentage of Overall Mathematics Instructional Time



Alignment Re-centered: 0.3086

Administration Year: 2006 2005
 Sample Selection: OR Std (02) Gr. 5
 Report By: All Data Grade 5

Show Data Tables

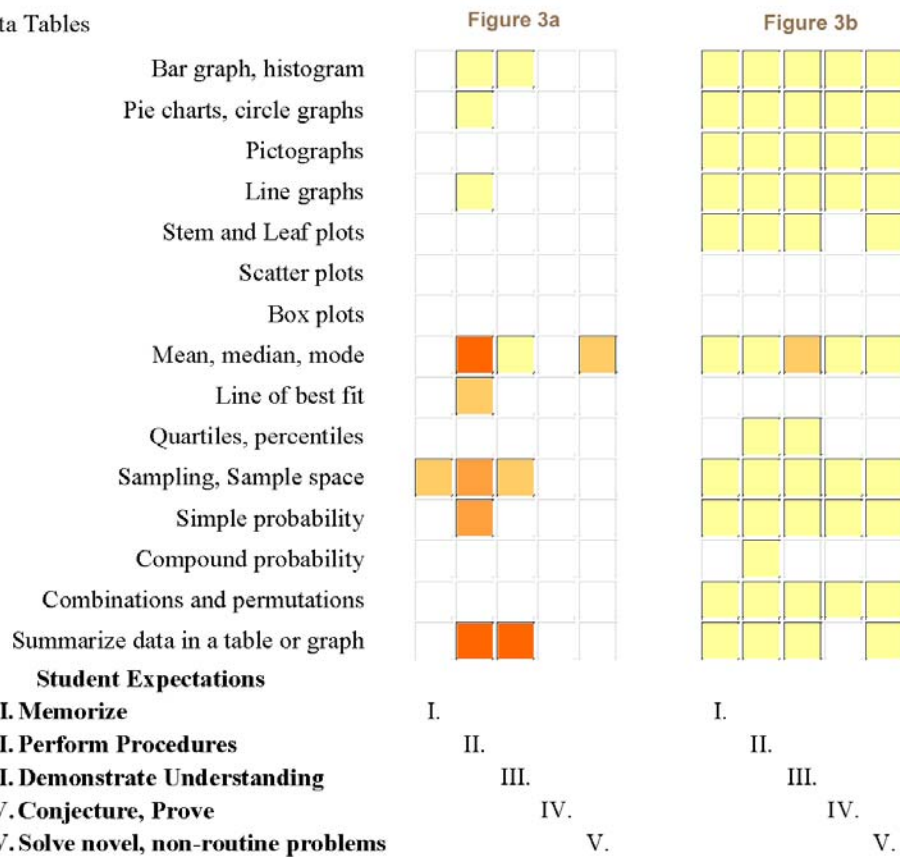


Figure 3a (Grade 5 OR Standards: Data Analysis / Probability / Statistics) and Figure 3c (Enacted curriculum for 2006 for Grade 5 teachers in a Canyon Falls school).

Mathematics Content: Data Analysis / Probability / Statistics

Oregon

Percentage of Overall Mathematics Instructional Time

- = Not Covered
- = < 0.5%
- = < 1.0%
- = < 1.5%
- = >= 1.5%

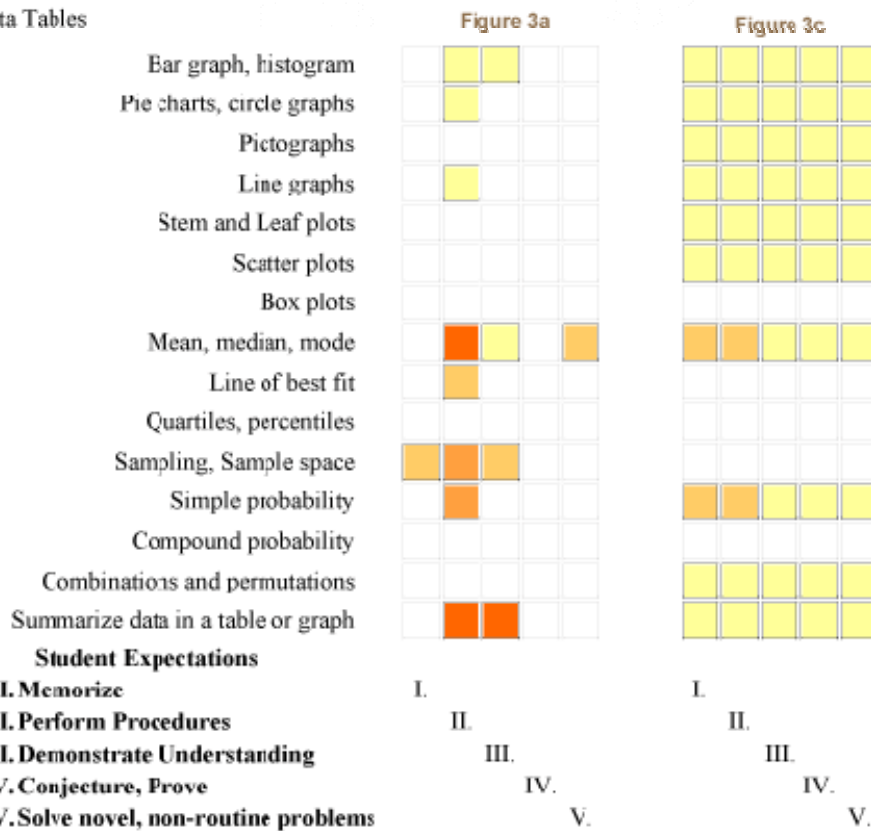
Alignment Re-centered: 0.2966

Administration Year: 2006 2006

Sample Selection: OR Stnd (02) Gr. 5

Report By: All Data Grade 5

Show Data Tables



On some topic-expectation combinations teachers moved toward greater alignment with the state standards. For example, the Grade 5 standards call for little or no coverage of topics such as *Quartiles / Percentiles*, and *Compound Probability*. When the teachers changed from covering such topics in 2005, to not covering them in 2006, it freed up some of their instructional budget for other topic-expectation combinations. In some cases freed instructional time was reallocated in ways that increased alignment (e.g. emphasis on the topic-expectation combination *Perform Procedures - Mean / Median / Mode* was increased so as to improve alignment.) Elsewhere freed instructional resources were reinvested in topic-expectation combinations not covered in the standards. For example, in 2006 these teachers began covering content in all expectation categories for the topic *Scatter Plots*; a topic not in the Grade 5 standards.

Identifying and responding practically to three basic types of non-alignment

Three basic types of non-alignment are revealed by close consideration of fine grain charts comparing standards to enacted instructional content.

Type I and Type II non-alignment. What can be called *Type I non-alignment* refers to situations where classroom content omits content included in a target such as the standards. Relative to the state standards, the teachers represented in Figure 3c enacted Type I non-aligned content regarding the *Sampling, Sample space* topic in 2006. Type I non-alignment deprives students of the opportunity to learn content that has been deemed important by the field. It also translates into lower school or district performance on standards-based assessments and accountability.

Type II non-alignment involves situations in which teachers spend time on something that is not addressed in a target such as the standards. Figure 3c shows Grade 5 teachers in 2006 combined to dedicate significant time to all five topic-expectation combinations for the topics *Pictographs, Stem and Leaf plots, Scatter plots, and Combinations and permutations* even though these topics are not targeted by the state's Grade 5 standards. In aggregate the teachers spent nearly 1.5% of their instructional time for the year on these four topics within *Analysis / Probability / Statistics*. This equates to approximately 3 class periods. If teachers spent as much time on topics not in the standards in the other six mathematics content domains it would have equated to 21 class periods per year. Most teachers would expect to see significant effects on student achievement if the school year were to be cut short or extended by four weeks. Avoiding a series of small decisions that have the same cumulative effect over the school year on students' opportunity to learn standards-based content requires monitoring Type I and Type II non-alignment.

Practical responses to Type I and Type II non-alignment

In the world of content alignment Type I and II non-alignment are the lowest hanging fruit. Teachers, grade level teams, schools, or districts that have high levels of Type I and Type II non-alignment are not looking closely at their SEC data, are not highly committed to standards-based instruction, or have not found effective ways to put standards-based commitment into practice. Type I alignment is especially inimical to standards-based instructional systems and can often be greatly reduced with modest resources and effort.

Attempts to address Type I non-alignment can lead quickly to problems with Type II non-alignment. For example, if teachers have a lot of Type II non-aligned content in their curriculum it exerts pressure to emphasize breadth over depth of content coverage. The prospect of squeezing even more topics into an already over-crowded curriculum to redress Type I non-alignment can be positively demoralizing. To make room for the new content, old content must go. Having an accurate inventory of content in the enacted curriculum that falls into the realm of Type II non-alignment can help teachers and schools make smart and therefore more palatable choices about which content is not essential at a given grade level and can therefore be dropped to ensure adequate emphasis on content that is essential.

Type III non-alignment. *Type III non-alignment* occurs when teachers place an appropriate amount of emphasis on a topic overall but do not distribute it across student expectation categories in a way that mirrors how the standards allocate emphasis. This begs the question as to whether the most effective way to teach is in fact to mirror the emphasis patterns in the

standards. From a research standpoint this is not a settled matter. Practitioners also vary on this. For example, in a situation where the standards place heavy emphasis on *communicating understanding*, teachers may disagree about what level of emphasis on other student expectation categories best scaffolds students toward understanding. Some teachers will point out that students will be helped in acquiring knowledge needed to communicate understanding if they are also asked to make connections and solve novel problems. Others will argue that student success with conceptual understanding, as well as making connections and solving novel problems, can be greatly hampered if students lack basic factual knowledge or computational facility.

To the extent there is consensus in the research on cognition and student learning it suggests that various aspects of thinking and doing are symbiotic and that ignoring one undermines the others. Until the complex relationships among student expectation categories and student learning are untangled the best advice may be the common sense approach; seek balance.¹⁸ Balance means not blocking students from grappling with important concepts until they have mastered related factual and procedural knowledge. Likewise it means not slighting facts or practicing procedures because they do not embody the ultimate goal of conceptual understanding or application of knowledge to novel problems.

According to this line of thinking, one of the great challenges in the craft of teaching is fostering student learning through effective management of the interplay between the different ways of knowing associated with the various student expectation categories. How can examining the SEC data on Type III non-alignment help teachers and instructional leaders with this complex matter?

Practical responses to Type III non-alignment

SEC data on Type III non-alignment does not provide anyone with answers about the “correct” way to teach. However, used carefully, it can help teachers and others develop a common way of defining what counts as “Procedural knowledge”, or “Communicating understanding”, or “Making connections.” Until teachers and others involved in instructional planning and delivery have a shared language for and conceptions of such things there is little chance of coordinated pursuit of a specific vision of teaching and learning. That is why, when SEC data are used primarily as a tool for teacher professional development, much attention is given to working toward a shared understanding of the SEC lexicon. Before a team of teachers can hash out the best way to promote students proficiency at “communicating understanding” of a topic the teachers have to agree more or less on what counts as understanding relative to the topic. Do teachers have consensus about the criteria for identifying understanding in student work samples, or instructional strategies (e.g., open-ended questioning and scaffolding) used to target understanding? We may not understand all the reasons why professional communities that have achieved shared understanding of student expectations may or may not further succeed in coming to grips with a shared concrete vision for desired teaching and learning. However, we know that achieving a shared understanding of student expectations is a necessary first step.

The relationship between the SEC instrument and data to instructional practice and student achievement in Canyon Falls

A basic premise underlies the SEC model: Achievement is in large part a function of student opportunity to learn content as defined by relative emphasis on measured topic-expectation combinations. Accordingly to make the case that SEC data and related technical assistance

contributed to achievement gains in Canyon Falls would require showing that alignment to the standards rose to a degree needed to translate into large achievement gains. As exploration of the Canyon Falls SEC data proceeded it became evident that alignment gains might not have been big enough and consistent enough across teachers and schools to account for observed achievement gains. As Table 1 showed, the number of teachers exhibiting overall gains in alignment to their grade level state mathematics standards barely exceeded the number of teachers losing ground against that target. Does all this mean that using the SEC did not contribute to student achievement gains in Canyon Falls? If alignment didn't improve a great deal overall, then what else may have helped "cause" student achievement to rise, and why not just stay focused on that going forward? Was the time and money that Canyon Falls invested in the SEC wasted? Is there any point in further use of the tool? What lessons can others take away for the Canyon Falls experience to date? These questions are addressed below.

Did SEC use in Canyon Falls contribute to student achievement gains? Although it seems unlikely that changes in alignment in the sample of classrooms measured explains the bulk of achievement gains at the district level there are numerous individual teachers who made substantial alignment gains. With time, money, and access to individual-level student achievement data it would be possible for researchers to determine whether changes in the alignment of individual teachers to standards led to improved achievement among students from their classes. This analysis is currently too expensive to carry out every time the SEC is used. However, researchers are confident that the relationship between alignment and student learning at the individual classroom level is very strong. The focus of the SEC collaborative of late has been on how to involve entire schools and districts in thinking about and working to improve alignment. The best way to make progress on that challenge is to learn as much as possible from places such as Canyon Falls that are taking a run at it.

Another reason for caution in interpreting the Canyon Falls alignment data relates to a point made early on about the 3 common strategies used by schools and districts to increase the alignment of the content students are taught to state standards. Even if teachers exhibited no change in alignment in the classes for which they completed surveys, Canyon Falls students could have been experienced greater access to aligned content as a result of structural changes. Recall for example how the district eliminated remedial classes that were poorly aligned to standards. SEC use was part of a district-wide press on data-driven instructional improvement. Would the district have made all the structural changes they did if the SEC was not part of the broader strategy used to foster change?

If alignment did not change much, then what might have caused student achievement to rise?

The article began by identifying instructional quality and motivation as factors that combine with alignment to drive achievement. Thought it was not the primary focus of the case study, data did come out suggesting that efforts to increase student motivation to perform on assessments and motivation for teachers to ratchet up academic expectations for all students were wide-spread in the district. Under NCLB many schools have become creative in providing students with incentives to do their best on tests. The very decision to administer the SEC and provide time for teacher and administrator reflection on the data, along with other data on teaching and learning, could be seen as a way to motivate higher teacher dedication to producing student achievement. Instituting rules calling for the elimination of tracking and putting certified mathematics teachers in ESL math classes are also examples of the kind of school and district actions that teachers

often see as strong signals that their organization is getting more serious about aiming high with all students.

Why not just stick to the strategy that has produced improvement so far?

Sustaining high levels of motivation among students, teachers, and other district staff is essential to high performance. Still, motivation remains only one element in success. High student motivation yields limited results when students are confronted with content they have never studied. Likewise, merely presenting content is not sufficient. Teachers must have formal and informal ways to assess student success with important concepts weekly if not daily. Only by informing classroom instructional strategies can classroom assessment help optimize instructional quality.

Even if it is true that Canyon Falls has leaned especially heavily on the motivation piece for achievement gains to date, it is impossible to rule out that additional increases in motivation would produce further gains. However, it seems likely that the district is closer to the point of diminishing returns on the motivation front than they are, for example, on the alignment side of the equation. If the analysis offered in this article is on track it indicates that there is considerable low-hanging fruit to be garnered by looking closely at responding to alignment issues—especially Type I and Type II non-alignment.

What further use of the SEC data might be productive for Canyon Falls?

This article has pointed to areas of promising SEC data use at the level of individual teachers, grade level teams, and cross-grade groups at the school and district level.

Individual teachers would need to print out and review at least the following series of SEC reports using the online report generator to get a basic understanding of the alignment of their own instruction to targets such as the state standards as seen through the SEC lens:

- Coarse grain maps or tile charts showing the alignment of one's instructional content to the appropriate grade level state standards for each year the survey has been completed (see, e.g., Figures 2a-2c.)
- Fine grain maps or charts showing the alignment of one's instructional content to state grade-level standards for each of the content areas within one's subject area for each year the survey has been completed (see, e.g., Figures 3a-3c.)

Every grade-level team would require the same two series of reports to understand the alignment of the team's instruction to state standards or other targets. As with individual teachers, it is essential to compare the same reports over successive years to understand trends in alignment.

For school level analysis it is necessary to have a set of grade level reports for each grade level in the school. District analysis can be done by grade-by-grade, school-by-school, or both.

The goal is to engage teachers and others in reflecting on similarities and differences in data across time and system levels. Nancy Love's advice¹⁹ is to focus on describing data first before trying to identify potential causes of problematic patterns. The Canyon Falls administrator quoted earlier displayed an appreciation of how to begin this process.

Did Canyon Falls waste their time with the SEC?

The mere act of collecting data rarely causes changes in behavior in complex places such as schools or classrooms. When data makes a difference it works by helping reflective teachers and other instructional leaders make informed choices about where to put their energies going forward. If Canyon Falls had not administered the SEC it is unlikely they would be in a very good position to identify important content they have skipped, or non-standards content they have spent much time on that may be contributing little to student achievement. The fact that all teachers and instructional leaders have not systematically addressed Type I and II non-alignment does not mean that doing so would not pay big dividends. Perhaps the more pertinent question is whether further substantial gains in student achievement are likely or even possible in Canyon Falls without a hard look at Type I and II non-alignment?

Conclusion: Easy and difficult parts of data-informed standards-based instructional improvement in classrooms, schools, districts, and states

When standard-based reform was new teachers and other instructional leaders were presented with a nearly impossible task in part because there was no practicable way to inventory content on the fundamental dimensions of topics and student expectations. Tools such as the SEC have provided a valuable if imperfect tool for generating an instructive description of the enacted curriculum at the level of individuals or groups of teachers. This has simplified an aspect of data gathering; generating and printing a set of coarse and fine grain maps or tile charts for an individual teacher for a single year requires approximately 15 minutes for mathematics. Identifying Type I and Type II non-alignment in one's data would take a teacher approximately 10 to 20 minutes.

The Canyon Falls case underscores that the difficult part is not getting the data, but triangulating on problems to make sure they are clearly understood and then devising a strategy to address them. Many things have to come together for this to proceed. First, educators at all levels, especially teachers, must be highly committed to their state standards as the primary authority on curricular content. States can increase teacher commitment to standards by seeking practitioner feedback as standards are revised. However, individual teachers will always differ to some degree about the optimal order of topics and the appropriate balance of emphasis on student expectation categories. Where teachers plan, deliver and reflect on instruction in relative isolation, differences among teachers are most likely to become expressed as markedly variable learning opportunities for students.

The difficult part is coming together to productively discuss and retool content, teaching and learning across grade levels and role groups (e.g., among teachers and administrators). It takes time (and technical assistance) simply for school people to develop a shared vocabulary for talking about content in a way that is attuned to standards-based content. Upon clarifying their instructional vision it is likely that all three types of non-alignment described above will be evident. Addressing each type of non-alignment takes time. It is difficult for teachers to find that time—to take it away from other ways of serving students that may have better understood impact. It is also difficult for administrators to reallocate resources to provide teachers with supported opportunities to gather, analyze, and respond to data. And just as teachers are not born knowing how to teach standards-based content to all children, administrators do not

automatically know how to help guide organizational learning through the maze of pressures and mixed signals under which schools operate.

As the Canyon Falls work shows, data-informed, standards-based instructional improvement is not accomplished at the flip of a switch. It is a process in which advances occur as educators at all levels of the state and district progress through distinct but interrelated developmental processes. The parallels, when they occur, are forged by working in a coordinated way over time toward a shared vision of standards-based learning. The Canyon Falls case provides others with insight into one strategic approach to pushing through organizational fragmentation and professional isolation to focus on the heart of teaching and learning. Perhaps the strategy of instructional leaders in Canyon Falls is best summarized as follows: work on the ground while aiming for the sky. The strategic particulars may vary from one district or school to another. The importance of working on concrete tasks in relation to one's vision may not.

¹ Canyon Falls is a pseudonym for a relatively small district with a rapidly rising proportion of students with limited English proficiency. The purpose of this case study is to learn from a pioneering district's efforts to engage in data-driven instructional improvement, not to evaluate district work.

² The district's strong rate of improvement on state and federal accountability measures has continued through School Year 2005-06.

³ The author wishes to thank the state and district educators who shared their experience. Current ODE staff members who are involved in work with the SEC and districts such as Canyon Falls include Kathleen Vanderwall and Drew Hinds. Thanks as well to John Smithson, Principal Investigator of the *Surveys of Enacted Curriculum* project at the Wisconsin Center for Education Research, for assistance in developing new ways to retrieve and analyze data from the SEC database.

⁴ A brief introduction to basic features of the SEC is provided below, but reader familiarity with the SEC is largely assumed. To learn more about the SEC and how it is used in states and districts nationally see the following websites: <http://seconline.wceruw.org/secWebHome.htm>, and http://www.ccsso.org/projects/Surveys_of_Enacted_Curriculum/. New features are continuously being added to the SEOnline site. This article used the 2006 version of the site. Upgrades planned for the first quarter of 2007 will make some of the analyses illustrated here easier and more precise than they were in 2006. For more information about how the Oregon State Department of Education is supporting SEC use in districts and schools, see <http://www.ode.state.or.us/search/results/?id=235>.

⁵ The SEC State Collaborative is a group of states and districts working together to use the Surveys of Enacted curriculum suite of tools and related strategies to help state, districts, schools, and teachers assess, understand, and purposefully improve the alignment of instruction to state and national standards to increase the level and equity of standards-based student achievement. More information on the SEC Collaborative is available online at: http://www.ccsso.org/projects/Surveys_of_Enacted_Curriculum/

⁶ The SEC taxonomy has also been used in some cases to content code particular curricular materials such as FOSS Science Kits, and Connected Math.

⁷ For a summary of research finding about the relationship between content alignment and student learning based on studies using the SEC, see Porter, A. C (2002). "Measuring the content of instruction: Uses in research and practice," in *Educational Researcher*. American Educational Researcher Association: Washington: DC. Available on-line at:

http://www.aera.net/uploadedFiles/Journals_and_Publications/Journals/Educational_Researcher/3107/3107_02PresAddress.pdfhttp://www.aera.net/uploadedFiles/Journals_and_Publications/Journals/Educational_Researcher/3107/3107_02PresAddress.pdf

⁸ Unless noted otherwise SEC data used for this article were retrieved using the SEOnline report generator.

⁹ In the SEC approach content maps for state standards and assessments are based on the aggregation of ratings rendered by four individuals. SEC raters generally include a mix of state and district subject area specialists and teachers. Raters include at least one individual from the state whose documents are being content coded, and at least one rater from another state.

¹⁰ Each content area is composed of numerous related topics. For example, The content area *Number Sense/Properties/Relationships* includes 16 different topics, such as Place Value, Whole Numbers, Operations, Fractions, Decimals, Percents, Estimation, Order of Operations, and so on.

¹¹ Information about the Nancy Love resource is available online at: <http://www.terc.edu/work/739.html>

¹² For an excellent, concise discussion of using SEC with other data in a collaborative approach to instructional planning and improvement, see Diana Nunnaley (Spring, 2004) “Test Scores: What can they tell us?” in *Hands On!*, TERC. Available online at: <http://www.ccsso.org/content/pdfs/DianaNarticleDECJune04.pdf>

¹³ The reduction in tracks was slated for implementation in School Year 2006-07. SEC and student achievement data are not yet available to assess the impact of the changes in tracking on student access to standards-based content or performance.

¹⁴ Two aspects of this tool had the potential to work at cross-purposes with the SEC survey. First, the district curriculum mapping tool asks teachers to plan and reflected on content primarily in relation to *topics* covered, with no explicit attention given to the student expectations dimension of content. Yet, as discussed earlier, teachers can and do cover any given topic in various ways, often including some that are not attuned to the student expectations embodied in standards. Whenever multiple content tools or frameworks are in play it is important to make sure teachers keep sight of this two-dimensional aspect of content.

Second, in Canyon Falls, the district deployed the curriculum mapping tool such that every teacher’s data would be viewable by any other teacher or administrator in the district. In contrast, the SEC is set up to protect individual teacher data from being viewed by anyone other than the teacher. The SEC policy is based on a desire to preclude the data being used for accountability purposes and to protect teachers from pressure to report socially acceptable data. There may have been good arguments for making individual teacher data on the curriculum mapping tool available to all. However, such arguments should be weighed against the possibility that the practice will encourage teachers to report skewed data on the mapping tool and, if that were to occur, it might lead to similar skewing in the reporting of content coverage on the SEC.

¹⁵ SEC users in the field do not have access to individual-level SEC data except their own. This means the analysis reported next could only be replicated in Canyon Falls or elsewhere by teachers voluntarily sharing their SEC data. Coordinating that at the district level may not always be worth the effort. However voluntary sharing of this nature is also necessary to carry out very useful grade-level analysis in which one compares and contrasts the data from numerous classrooms with a content target held in common. This potentially powerful use of SEC data happens only where the people being asked to share their individual data trust that those who will join the conversation (e.g., grade-level team colleagues) will do so constructively, collaboratively, and reflectively.

¹⁶ Oregon math assessments have been coded only at grades 3, 4, 5, 6, 7, 8 and 10. Consequently the grade 3 assessment had to be used as the target in calculating the alignment of instruction to assessments for teachers in grades K-3. Also, in Oregon assessments have been coded only for one test form per grade level for a single year. Assessments vary from one form and year to the next with respect to the parts of the larger content domain they sample in order to assess large student populations. Thus the alignment of teachers to tests at all grades, but especially in the lower primary grades, must be seen as approximate and not as an adequate basis for classroom instructional decision-making.

¹⁷ Tile charts and contour maps convey essentially the same information about content using different formats. These are Coarse Grain charts, meaning they include data for all mathematics topics (with clusters of closely related topics aggregated by content area) and student expectation combinations.

¹⁸ See Porter, A. C. (1989) “A curriculum out of balance: The case for elementary school mathematics”, in *Educational Researcher*, Vol. 18, No. 5, pp 9-15, for discussion of the value of balance in the intended and enacted curriculum.

¹⁹ For information on the Nancy Love approach to data-driven decision-making, see: <http://www.terc.edu/work/739.html>