Professional teaching innovation configuration

Framing

The *professional teaching innovation configuration* is based on the work of the Silicon Valley Mathematics Initiative, a program of the Noyce Foundation. The SVMI developers crafted a framework that describes key dimensions of sound teaching in mathematics. While the SVMI framework focused exclusively on mathematics, it presents a vision for excellence in teaching and learning as an overarching statement of philosophy and purpose that can be used to look at professional teaching in any content area.

The innovation configuration that the Dana Center derived from the SVMI framework encompasses six key dimensions of professional teaching:

A. Worthwhile tasks
B. The learning environment
C. Teacher role in discourse
D. Student role in discourse
E. Tools for enhancing discourse
F. Analyses of teaching and learning

How closely does our vision for professional teaching align with these dimensions?

How closely might we want our teaching to align with these dimensions?

How to use the professional teaching innovation configuration

In the *professional teaching IC*, we adapted the SVMI framework's dimensions of mathematics professional teaching to be applicable to any content area, and we then parsed these dimensions into sets of indicators—an innovation configuration—that provide a clear, descriptive vision of what these teaching dimensions look like in action.

For each dimension, we have created a continuum that lists program indicators for four levels of implementation. The ideal (level I) implementation of each of the six dimensions is described at the beginning (left end) of the continuum, with three progressively less developed levels of implementation flowing along the continuum to the right.

This innovation configuration can be used in conjunction with the other tools in this resource to gather data about the current state of teaching in a specific content area and to facilitate collaborative work toward a common vision of an optimal state.

Note that the numbering for the list of indicators in each dimension is not intended to identify priority or rank; rather, this numbering is meant to help track permutations of an indicator across levels.

For example, in Dimension A: *Worthwhile tasks*, the level I indicator 1 tracks to progressively weaker versions of indicator 1 in levels II, III, and IV.

It must also be noted that there is nothing negative in finding that a local program is not operating at level I, the most ideal state. The implementation of any innovation will naturally progress through varying levels of fidelity to the ideal. It would be rare indeed for a new program to roll out at its most ideal state.

A few scenarios of use

Scenario one

The *professional teaching innovation configuration* could be used by coaches and teachers to reach a shared understanding of their work. When coaches and teachers work together, sharing a mutual understanding of that work ensures greater progress toward positive outcomes.

Scenario two

Teachers review the IC to select an area on which they would like to focus when working with the coach.

In what ways does our professional teaching currently approach each of these dimensions?

How might these dimensions appear differently to people in different levels of the system?

What sorts of evidence might we look for to support our perceptions?

Scenario three

Using this IC, teams of teachers implement and experience collaborative, nonevaluative classroom observations. When teacher teams use this IC to identify an ideal state for teaching practice, they can then choose a focus for professional learning. They might note a particular dimension for which they need to gather more data to substantiate or disprove a concern; they might craft a plan for their collaborative growth as a team.

Scenario four

Using this IC and the *professional teaching data tool*, a representative team of educators from throughout the school system (including district administrators, curriculum and instruction directors, campus administrators, lead teachers) can arrive at a common understanding of good teaching practice, gather systemwide data about the current state of teaching in the district, and craft or refine district expectations for teaching. As with users of the *district instructional program IC* and the *instructional coaching IC*, the next stage for users of the professional teaching IC—after identifying the current levels of implementation on each of the dimensions—is to focus the work on one or two dimensions.

What trends or patterns are emerging from the data collected?

What might we want to work toward?

What are we committing to?

Strengths and concerns to consider

Strengths

The professional teaching innovation configuration and its companion data tool provide vehicles for

- reaching a common understanding of what constitutes effective teaching practice.
- engendering a common vision for the work of teachers, a way to ensure alignment of professional development, and a systemwide lens for observing classroom practice.
- developing action plans and next steps.

Concerns

The professional teaching innovation configuration and its companion data tool are based on an ideal state for the complex work of teaching. Thus, it is critical that great care be taken in facilitating work with these tools to ensure that participants do not become overwhelmed by the work ahead.

Particularly when developing action plans, it's useful to begin by identifying the most critical dimensions—those requiring immediate attention—and planning to address the other dimensions in the near future. Enacting this process in stages helps focus participants on taking the incremental steps necessary to move toward the ideal.

It is also important to ensure that no one group within the system—e.g., teachers, campus and district administrators, instructional/content specialists—be responsible for all the work on an action plan. The entire district system is responsible for supporting teaching and learning, so all action plans should be designed to work at multiple levels of the system and with all groups responsible for the education of students.

Professional teaching innovation configuration

Dimension A: Worthwhile tasks

Level I indicators

1. The teacher engages students in worthwhile tasks.
2. The tasks are all part of a coherent curriculum that develops student understanding of—and facility with—the content area.
3. The tasks are clear, aligned with core standards, and developed to help students make sense of the world.
4. The tasks engage students in thinking, conducting problem solving, and developing concepts and skills.
5. The tasks involve students in using a wide range of mediums, such as graphs, charts, problems, symbols, equations, manipulatives, narrative, argument, research, performance, technology, and so on.
6. The teacher selects materials and tasks that build on—and extend from—students' understanding.
7. Most of the tasks foster students' ability to solve problems, reason, and communicate.
8. The tasks range across most learning styles and modalities.
9. The tasks may grow out of student conjectures or questions.
10. Often the tasks may be approached in more than one interesting and legitimate way.
11. Most of the tasks vary in the length of time required to develop solutions.

Level II indicators

1. Often the teacher engages students in worthwhile tasks.
2. Most of the tasks are part of a coherent curriculum that develops student understanding of—and facility with—the content area.
3. The tasks are often clear, aligned with core standards, and developed to help students make sense of the world.
4. Many of the tasks engage students in thinking, conducting problem solving, and developing concepts and skills.
5. The tasks involve students in using a range of mediums.
6. The teacher often selects materials and tasks that build on—and extend from—students' understanding.
7. Many of the tasks foster students' ability to solve problems, reason, and communicate.
8. The tasks range across many learning styles and modalities.
9. The tasks may grow out of student conjectures or questions.
10. Many of the tasks may be approached in more than one interesting and legitimate way.
11. Many of the tasks vary in the length of time required to develop solutions.

Dimension A: Worthwhile tasks

Level III indicators

1. Fairly often the teacher engages students in worthwhile tasks.
2. The tasks are usually either from adopted textbooks or consist of investigations or nonroutine problems.
3. The tasks are usually clear, aligned with core standards, and developed to help students make sense of the world.
4. Some of the tasks engage students in thinking, conducting problem solving, and developing concepts and skills.
5. Some tasks involve students in using a range of mediums.
6. The teacher sometimes selects materials and tasks that build on—and extend from—students' understanding.
7. Some of the tasks foster students' ability to solve problems, reason, and communicate.
8. Some of the tasks range across learning styles and modalities.
9. A few of the tasks may grow out of student conjectures or questions.
10. Some of the tasks may be approached in more than one interesting and legitimate way.
11. Some of the tasks require more time to develop solutions.

Level IV indicators

1. Occasionally the teacher engages students in worthwhile tasks.
2. The tasks are usually a part of an adopted textbook curriculum.
3. The tasks focus on skill acquisition and developing procedural knowledge.
4. A few of the tasks engage students in thinking, conducting problem solving, and developing concepts and skills.
5. A few tasks involve students in using a range of mediums.
6. The teacher occasionally selects materials and tasks that build on—and extend from—students' understanding.
7. A few of the tasks foster students' ability to solve problems, reason, and communicate.
8. Most of the tasks involve direct instruction.
10. A few of the tasks may be approached in more than one interesting and legitimate way.
11. A few of the tasks require more time to develop solutions.

Dimension B: The learning environment

Level I indicators

1. The teacher creates a classroom environment in which students actively construct their own understanding of the content and learn to use that knowledge to make sense of the world.
2. The teacher creates a culture that fosters the development of each student's thinking and supports the class as a community of learners.
3. The teacher provides and structures all the time necessary to explore content and grapple with significant ideas and problems.
4. The physical space and materials are purposefully arranged and allocated in ways that facilitate student learning.
5. The teacher provides context that encourages student development of skills and proficiency in the content area.
6. The learning community includes essential attributes such as respecting and valuing students' ideas, encouraging multiple ways of thinking, and supporting students' positive disposition toward the content area.
7. The teacher consistently expects and encourages students to work independently or collaboratively to make sense of content.
8. Students take intellectual risks by raising questions, sharing results, and formulating conjectures.
9. Students display a sense of competence in the content area by validating and supporting ideas with reasonable arguments.

Level II indicators

1. Often the teacher encourages students to actively construct their own understanding of the content and to learn to use that understanding to make sense of the world.
2. The teacher often creates a culture that fosters the development of each student's thinking and supports the class as a community of learners.
3. The teacher provides and structures a lot of time to explore the content and grapple with significant ideas and problems.
4. The physical space and materials are arranged and allocated in ways that can facilitate student learning.
5. The teacher provides context that often encourages student development of skills and proficiency in the content area.
6. The learning community often includes essential attributes such as respecting and valuing students' ideas, encouraging multiple ways of thinking, and supporting students' positive disposition toward the content area.
7. The teacher often expects and encourages students to work independently or collaboratively to make sense of the content.
8. Students occasionally take intellectual risks by raising questions, sharing results, and formulating conjectures.
9. Students may display a sense of competence in the content area by validating and supporting ideas with reasonable arguments.

Dimension B: The learning environment

Level III indicators	Level IV indicators
1. The teacher regularly allows students to learn to use knowledge of the content to make sense of the world.	1. Some assigned problems require students to learn to use knowledge of the content to make sense of the world.
2. The teacher supports a culture that fosters the development of student skills in the content area and some problem solving skills. Occasionally the teacher supports the class in functioning as a community of learners.	2. The class is usually taught in a direct instruction format.
3. The teacher provides and structures some time to explore nonroutine problems and grapple with conceptual ideas.	3. Usually the focus of the lesson is on skill attainment or learning procedures and definitions in the content area.
4. The physical space and materials are arranged and allocated in ways that attempt to facilitate student learning.	4. The physical space and materials are arranged and allocated in ways that structure students' work.
5. The teacher strives to develop student skill and proficiency in the content area.	5. The teacher's goal is to develop student skills and proficiency in the content area. Students are required to practice during class and complete homework.
6. Students' ideas and ways of thinking are sometimes part of the learning activity.	6. Often the teacher asks the students to show their thought processes in writing and/or computations.
7. The teacher often expects students to work independently and may use some collaborative groups.	
8. Often the teacher involves students by having them raise questions and share results.	8. Occasionally students are asked to share answers with the class. Students are encouraged to ask questions if they lack understanding.

Dimension C: Teacher role in discourse

Level I indicators

1. The teacher orchestrates discourse in the class.
2. The teacher poses questions and tasks that elicit, engage, and challenge each student's thinking.
3. The teacher listens carefully to students' ideas and discerns meaning and relevancy from student responses.
4. Students are asked to clarify and justify their ideas orally and in writing.
5. The teacher decides what to pursue in depth from among the ideas that students bring up during a discussion.
6. The teacher takes care to develop concepts thoroughly and ensure students' ownership and understanding of the concepts.
7. The teacher decides when and how to attach content-area-specific notation and language to students' ideas.
8. The teacher has a full understanding of the goals of the lesson and decides when to provide information, when to clarify an issue, when to model, when to lead, and when to let a student struggle with difficulty.
9. These decisions are consistent with the goal and pace of the lesson.
10. The teacher monitors student participation in discussions and decides when and how to encourage each student to participate.
11. These decisions are predicated on ensuring that all students will learn and be successful in the content area.

Level II indicators

1. The teacher often orchestrates discourse in the class.
2. The teacher often poses questions and tasks that elicit, engage, and challenge each student's thinking.
3. Often the teacher listens to the students' ideas and makes sense of their responses.
4. Often students are asked to clarify and justify their ideas orally and in writing.
5. The teacher may decide what to pursue in depth from ideas that students bring up during a discussion.
6. The teacher takes some care to develop concepts and to encourage students' ownership and understanding of the concepts.
7. The teacher attempts to attach content-area-specific notation and language to students' ideas.
8. The teacher has good understanding of the goals of the lesson and is often successful in determining when to provide information, when to clarify an issue, when to model, when to lead, and when to let a student struggle with difficulty.
9. These decisions are often consistent with the goal and pace of the lesson.
10. The teacher attempts to monitor student participation in discussions and decides when and how to encourage students to participate.
11. The teacher makes attempts to reach all students.

Dimension C: Teacher role in discourse

Level III indicators	Level IV indicators
1. The teacher directs the class and attempts to foster discourse.	1. The teacher directs the class.
2. Sometimes the teacher poses questions and tasks that elicit, engage, and challenge students' thinking.	2. The teacher poses questions and tasks that focus students' work.
3. The teacher listens to some of the students' ideas. The teacher may have difficulty following students' thinking.	3. The teacher may listen to some of the students' responses. The teacher may have difficulty following students' thinking and usually ignores those responses.
4. Sometimes students are asked to clarify and justify their ideas orally and in writing.	4. Rarely are students asked to clarify and justify their ideas orally and in writing.
5. The teacher rarely deviates from the lesson plan to pursue ideas that students bring up during a discussion.	5. The teacher rarely deviates from the textbook to pursue ideas that students bring up during a discussion.
6. The teacher takes some care to develop concepts and to encourage students' ownership of the concepts.	
7. The teacher follows the textbook in deciding when and how to introduce content-area-specific notation and language.	7. The teacher usually follows the textbook in deciding when and how to attach content-area-specific notation and language to students' ideas.
8. The teacher follows the curriculum's goals for the lesson.	8. The teacher follows the curriculum's goals for the lesson.
9. The teacher is developing the pacing and generating good questioning. The instructional decisions may be aligned with lesson goals.	9. The instructional decisions may be aligned with state standards and with the goal of covering topics on the state assessment.
11. The teacher attempts to include all students.	11. The teacher modifies expectations from student to student.

Dimension D: Student role in discourse

Level I indicators

1. The teacher promotes classroom discourse in which students have ownership and responsibility.
2. Students listen to, respond to, and question the teacher and one another.
3. Students use a variety of tools to reason, make connections, solve problems, and communicate.
4. Students often initiate problems and questions for the class to ponder and study.
5. Students regularly make conjectures and present solutions.
6. Students explore examples and counterexamples to investigate conjectures.
7. Students try to convince themselves and one another of the validity of particular representations, solutions, conjectures, and answers.
8. Students rely on evidence and argument to determine validity.
9. In small or large groups, students are an audience for one another's comments, explanations, or questions.
10. The discourse is focused on making sense of ideas and/or on using those ideas sensibly in setting up and solving problems.

Level II indicators

1. The teacher often promotes classroom discourse in which students have ownership and responsibility.
2. Students often listen to, respond to, and question the teacher and one another.
3. Students use some tools to reason, make connections, solve problems, and communicate.
4. Students sometimes initiate problems and questions for the class to ponder and study.
5. Students often make conjectures and present solutions.
6. Students may explore examples and counterexamples to investigate conjectures.
7. Students occasionally try to convince themselves and one another of the validity of particular representations, solutions, conjectures, and answers.
8. Sometimes students rely on evidence and argument to determine validity.
9. In small or large groups, students are often an audience for one another's comments, explanations, or questions.
10. The discourse is often focused on making sense of ideas and/or on using those ideas sensibly in setting up and solving problems.

Dimension D: Student role in discourse

Level III indicators

1. The teacher tries to promote classroom discourse in which students have some ownership and responsibility.
2. Occasionally students listen to, respond to, and question the teacher and one another.
3. Students use a few tools to reason, make connections, solve problems, and communicate.
4. Once in a while students initiate problems and questions for the class to ponder and study.
5. Students occasionally make conjectures and present solutions.
6. Students occasionally explore examples and counterexamples to investigate conjectures.

8. In a few situations, students rely on evidence and argument to determine validity.
9. In small or large groups, students are occasionally an audience for one another's comments, explanations, or questions.
10. The discourse is sometimes focused on making sense of ideas and/or on using ideas sensibly in setting up and solving problems.

Level IV indicators

1. The teacher structures the discourse of students.
2. Often students are asked questions by the teacher and are expected to respond with answers.
3. Students use a few tools to solve problems and do tasks.
4. For specific assignments, the teacher assigns students to create problems and questions for the class to do.
5. Students are asked to present answers or solutions.
6. Students learn and practice procedures, vocabulary, and facts related to the content area.

9. Occasionally students work in small groups on problems, discussing answers. In large groups, students go over problems and solutions, usually facilitated by the teacher.
10. The discourse involves learning procedures and methods to solve problems and doing activities to memorize facts and vocabulary related to the content area.

Dimension E: Tools for enhancing discourse

Level I indicators

1. The teacher encourages discourse and a positive classroom culture by supporting students in using tools to learn.
2. The teacher encourages students to apply tools related to the content area in the manner that these tools are applied outside school.
3. The teacher encourages the use of a variety of tools—such as computers and other technology—in addition to traditional paper-and-pencil tools. Students communicate orally and in writing, using strategies such as pictures, diagrams, tables, graphs, notations, symbols, narratives, metaphors, justifications, and proofs.
4. Students use models and concrete materials to make sense of the content area and understand concepts.
5. Students are responsible for selecting and using appropriate tools to solve and investigate problems.
6. The teacher introduces the conventional notation and vocabulary of the content area at points when doing so can further the work and the discourse at hand.
7. Students are expected to communicate their conjectures, explanations, and arguments completely, using appropriate tools.

Level II indicators

1. The teacher usually encourages discourse by supporting students in using tools to learn.
3. Often the teacher encourages the use of a variety of tools—such as computers and other technology—in addition to traditional paper-and-pencil tools. Students communicate orally and in writing, using strategies such as pictures, diagrams, tables, graphs, notations, symbols, narratives, metaphors, justifications, and proofs.
4. Often the teacher has students use models and concrete materials to make sense of the content area and understand concepts.
5. Occasionally students are responsible for selecting and using appropriate tools to solve and investigate problems.
6. The teacher attempts to introduce the conventional notation and vocabulary of the content area at points when doing so can further the work and the discourse at hand.
7. Occasionally students are expected to communicate their conjectures, explanations, and arguments completely, using appropriate tools.

Dimension E: Tools for enhancing discourse

Level III indicators

1. The teacher structures the tools that will adapt to the particular lessons.

3. The teacher finds times to use computers and other technology. The teacher will, at certain times, encourage the students to communicate using strategies such as pictures, diagrams, tables, graphs, notations, symbols, narratives, metaphors, justifications, and proofs.

4. Students use manipulatives on appropriate activities.

6. The teacher introduces conventional notation and the vocabulary of the content area often after students have had some kind of concrete experience or when the textbook suggests the teacher do so.
7. Occasionally students are expected to communicate their solutions and explanations, using a variety of tools.

Level IV indicators

1. The teacher directs the class as to when they may use a certain tool.

3. The teacher may do an activity with the computer or use it for those who either need practice or have finished their assignments. The teacher directs the type of outputs expected, such as charts, graphs, equations, or proofs.

4. When called for in a lesson, the class may use manipulatives.

6. The teacher regularly introduces the conventional notation and vocabulary of the content area to the class.

7. There may be special projects or assignments where students communicate using alternative materials or tools.

Dimension F: Analyses of teaching and learning

Level I indicators

1. The teacher understands the fundamental interconnection of assessment of students, analysis of instruction, and the learning experience.
2. The teacher engages in ongoing analyses of teaching and learning by observing, listening to, and gathering information about the students to assess what they know and are able to do.
3. The teacher examines the effects of the tasks, discourse, and learning environment on students' knowledge, skills, and dispositions.
4. The teacher assesses what every student is learning, the concepts they understand, and whether they are applying significant concepts of the content area.
5. The teacher changes and adapts instruction based on his or her ongoing assessment of students' understandings.
6. The teacher regularly revises short-range and long-range plans. The teacher challenges and extends students' ideas.
7. The teacher attends to the broad array of dimensions that contribute to students' competence in the content area.
8. The teacher regularly describes and comments on each student's learning to the student's parents, other involved educators, and the student themselves.
9. The teacher uses a large variety of assessment measures and mediums to develop a robust evaluation of each student's understanding.

Level II indicators

1. Often the teacher links assessment of student work with the curriculum.
2. The teacher routinely engages in analyses of teaching and learning by observing, listening to, and gathering information about the students to assess what they know and are able to do.
3. The teacher often examines the effects of the tasks, discourse, and learning environment on students' knowledge, skills, and dispositions.
4. The teacher routinely assesses what many of the students are learning and the concepts they understand.
5. Usually the teacher changes and adapts instruction based on his or her ongoing assessment of students' understandings.
6. The teacher may revise short-range and long-range plans. The teacher often challenges and extends students' ideas.
7. The teacher attends to an array of dimensions that contribute to students' competence in the content area.
8. The teacher routinely describes and comments on each student's learning to the student's parents, other involved educators, and the student themselves.
9. The teacher uses a variety of assessment measures and mediums to develop a fair evaluation of students' understandings.

Dimension F: Analyses of teaching and learning

Level III indicators

1. The teacher attempts to link assessment with the curriculum.
2. The teacher assesses mostly by examining written products but also by observing, listening to, and gathering information about the students.
3. Periodically the teacher will reflect on the lessons and learning experiences and examine their effects on student progress.
5. The teacher paces the class based on what most of the students are accomplishing. The teacher will attempt to differentiate instruction and activities for the most successful and the most challenged students.
6. The teacher may revisit lessons where students have been unsuccessful.
7. The teacher attempts to use multiple representations to address learning styles.
8. The teacher follows conference and report card procedures to keep parents informed of student progress.
9. The teacher uses different evaluation measures—such as tests, quizzes, homework, classwork, reports, participation, and so on—to arrive at the students' grades.

Level IV indicators

1. The teacher assesses the students on ideas and problems after the students have been taught.
2. The teacher evaluates student learning mostly by examining written products, which are usually tests and quizzes.
3. The teacher may also grade students on homework and class participation.
4. Classroom behavior is often a factor in student grades.
5. The teacher is diligent about following the timeline of instruction based on a set of standards, the curriculum, and/or the textbook. The teacher may provide extra credit to those students who are the most successful and remedial assignments to those students who are most challenged.
6. Depending on time available, the teacher may reteach lessons where students have been unsuccessful.
7. The teacher mostly uses direct instruction for efficiency.
8. The teacher follows the district reporting policy for report cards.
9. The teacher may use different evaluation measures, but tests have the most weight.