Collecting and Analyzing Student Engagement Data as A Key Component for School Improvement, Organizational Learning, and Increased Achievement

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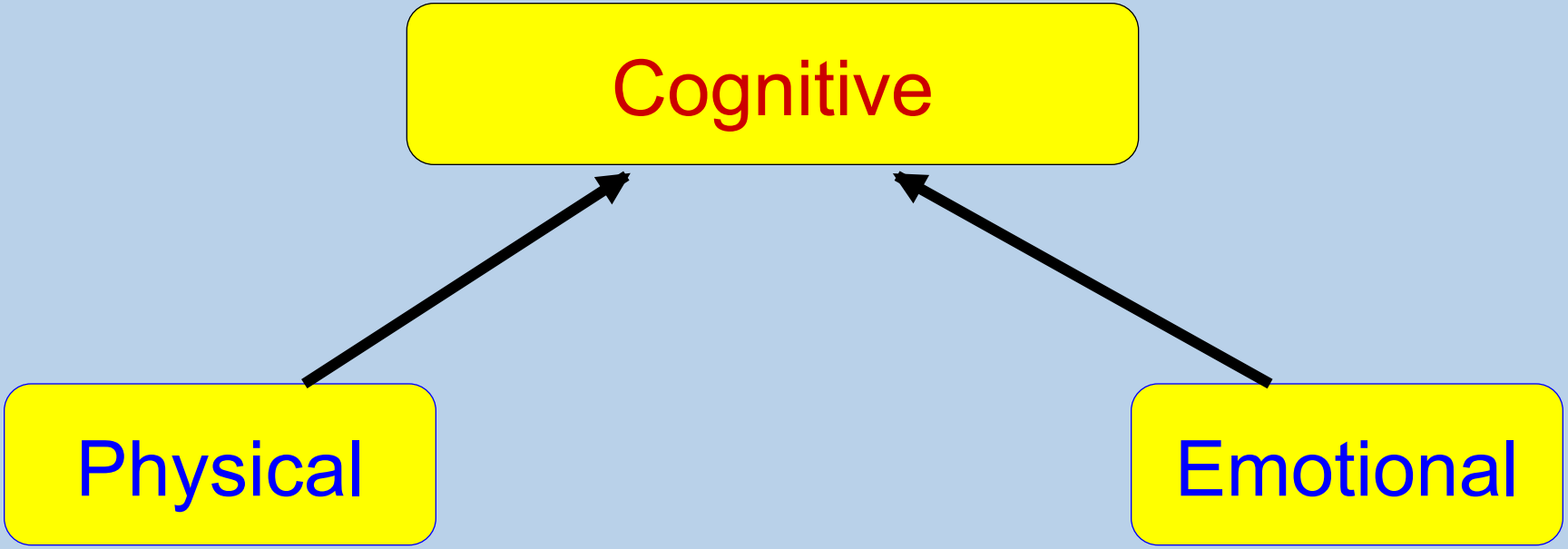
Criteria for these slides…

- Sound, research based knowledge
- Practical use in schools
- Practical use for you as a SI specialist…you can use all, most, some, a few of the slides with your schools.

Perspectives on Student Engagement

Addressing Engagement is critical to learning…here are some basics:

Three Broad Forms of Student Engagement in the Classroom



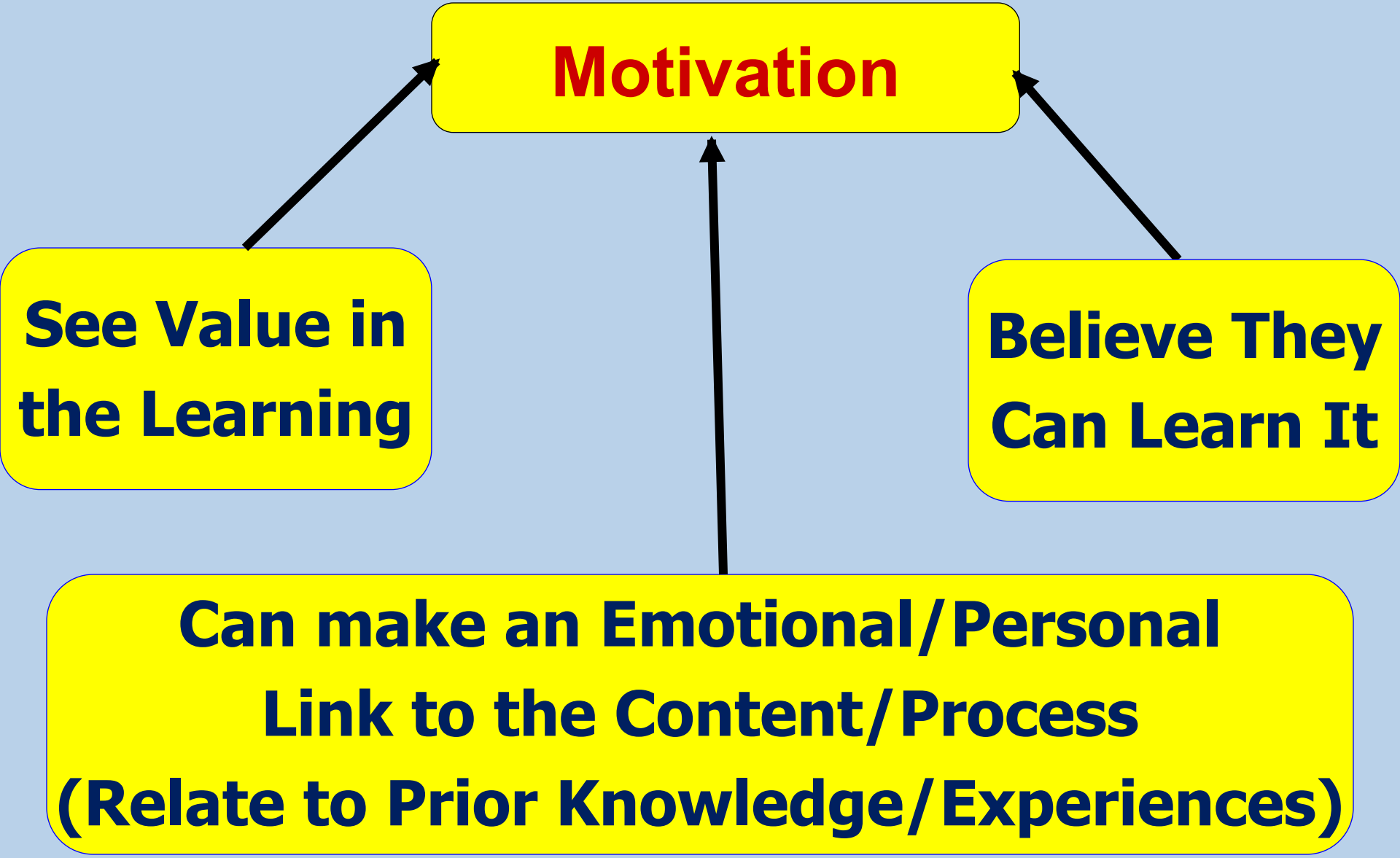
Physical and Emotional Support Cognitive

OUR FOCUS TODAY IS COGNITIVE ENGAGEMENT

Logical Perspectives on Physical Presence, Mental Attention, and Cognitive Engagement

- Attendance is a precursor to attention in class…
- Attention is a precursor to cognitive engagement…
- Cognitive engagement is a precursor to new learning for most students (building knowledge, understanding and ability).
- A few students are physically present in class but consistently cognitively absent.
- All students are, occasionally, physically present in class but cognitively absent.
- For most students…attendance, attention, and cognitive engagement are linked to learning through student motivation
- For most students…motivation to cognitively engage is a function of:
  - Teacher-Student Relationships
  - Emotional Security
  - Content Relevance
  - Challenging and Realistic Learning Experiences

Students are motivated to engage when…



Components of Meaningful Cognitive Engagement

Necessary Components

Attendance in School

Attendance in Class

Attention during Learning Experiences

Cognitive Engagement during Learning Experiences

Relevant and Challenging Learning Experiences

Student Self-Reflection/ Assessment/Goal Setting

Student Motivation to Attend and Cognitively Engage

Supportive Processes

Teacher builds Teacher-Student Relationships

School Protection of Classroom Learning Time

Teacher Use of Allocated Classroom Learning Time

Teacher Design of Relevant Challenging Lesson

Teacher is Enthusiastic Supportive, Facilitative toward Student Effort

ENGAGEMENT AND ACHIEVEMENT: THE BIG PICTURE

Terminology and Basic Numbers…

- **Academic School Day**
  - Beginning to ending time for school--e.g. 8:00-3:25 (445 minutes)
- **Allocated Learning Time**
  - Scheduled in-class time
  - What % of the Academic School Day is Allocated Learning Time?
  - (85%-90%) (375-400 minutes)
- **Engaged Learning Time**
  - Students are truly cognitively engaged in the learning experience
  - What % of the Allocated Learning Time is Engaged Learning Time?
  - (80-90%) (300-360 minutes)
  - **Surface Learning Time**
    - Simple comprehension, fact-finding, recall, and skill development/practice
    - What % of Engaged Learning Time is Surface Learning?
    - (80-85%) (250-300 minutes)
  - **Deeper Learning Time**
    - Analytical, critical, creative, innovative, and synthesis types of thinking
    - What % of Engaged Learning Time is Higher-Order Deeper Learning?
    - (15-20%) (30-60 minutes)

Table Reflective Discussion

- The basics of engagement are neither complex nor new…
- What information was affirming of what you already knew?
- Did you hear or read something that expanded your perspective about, or understanding of, student engagement? If so, what?
- What stands out in your mind right now about student engagement??????

What stands out the most in your mind right now about engagement?

Engagement and Achievement: The Classic Study

(Yair, 2000)

Yair Study of Cognitive Engagement

- Individual Student Engagement in Grades 6-8-10-12
  - Grade 6 in K-6 Schools and Grades 6 and 8 in K-8 Schools
  - Grades 6 and 8 in Middle Schools
  - Grades 10 and 12 in High Schools
  - Students selected randomly and stratified by gender, race, and ability level
- Data Collection Design
  - Digital wristbands
  - Randomly buzzed 8 times daily for a week
  - >3500 self-reports during in-class (allocated) learning time
  - Students Described:
    - Where are you? What are you doing? Who are you interacting with? What is on your mind?
    - How much are you concentrating? How challenging is it? How difficult is it? How interesting is it? How important is it to you? What else are you doing?

Source: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000)

Cognitive Engagement and Student Characteristics

- Boys were 21% more likely to be engaged than girls.
- Asian and white students were about 25% more likely to be engaged than African American and Hispanic students
- Sixth graders are 29% more likely to be engaged than 12th graders; 23% more than 10th graders, and 6% more than eighth graders
- The more students are engaged, the higher are their grade point averages

Source: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000)

In which subject is cognitive engagement the highest?

Subjects:	Rank order:
Mathematics	1
English	4
Reading	3
Science	2
Social Science	5

Compared to Math and Science and Reading, students in English and Social Studies are more than 40% less likely to be engaged cognitively with the content

Source: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000)

In which instructional method is cognitive engagement the highest?

Instructional Method	Engagement Rank	Is the Learning Active/Passive?
Teacher lecture	6	Passive for all
Class discussions (whole group T-led)	5	Passive for most
Laboratory (Hands-on work)	1	Active for all
Group work	2	Active for all
Individualized (seat) work	4	Passive for all
Presentation (creating/making)	3	Active for all

Sources: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000); Valentine (NSDC Conference (December, 2010)

Engagement and Instructional Methods

- When compared to teacher lecture learning experiences, the odds that students will be cognitively engaged are:
  - 125% higher during group learning experiences
  - 115% higher during a laboratory learning experiences
  - 90% higher during class presentation learning experiences
  - 70% higher during individualized learning experiences

Source: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000)

Engagement in Relevant and Challenging Learning Experiences

- The odds of students being engaged during the "most relevant" lessons were 108% higher than the lessons the students described as "least relevant."
- The odds of students being engaged during the "most challenging" lessons were 90% greater than when students identified the lessons as "least challenging."
- Relevance and challenge were the two most important lesson design strategies linked to student engagement in the study.

Source: Yair, Educational Administration Quarterly, Vol. 36, #4 (October 2000)

Engagement and Student Recall…

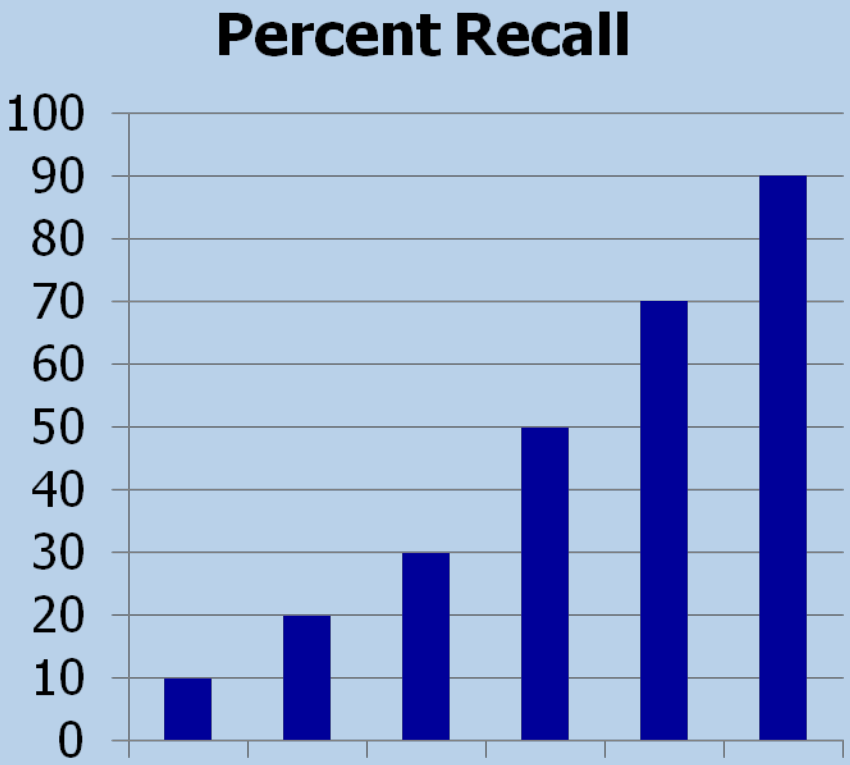
- The following slides are interesting, but the exact information reported is unique to the setting about which they are reporting. Do not take the findings literally across the board. Realize that they are being used herein as a way to make a point about engagement and recall, rather than as an empirical finding. You will see what I mean when I explain them…
- And, as you look at the slides, realize that we all know this, both intuitively as well as through our own knowledge of how students learn and through our knowledge of general research about instructional methods.

Learning Pyramid: Recall in Two Weeks from Audio-Visual Instruction

(Edgar Dale, Audio-Visual Methods in Teaching)

Caveat: pyramid is considered more theoretical than empirical…use only to stimulate discussion about Passive and Active forms of learning.

How much we remember when…



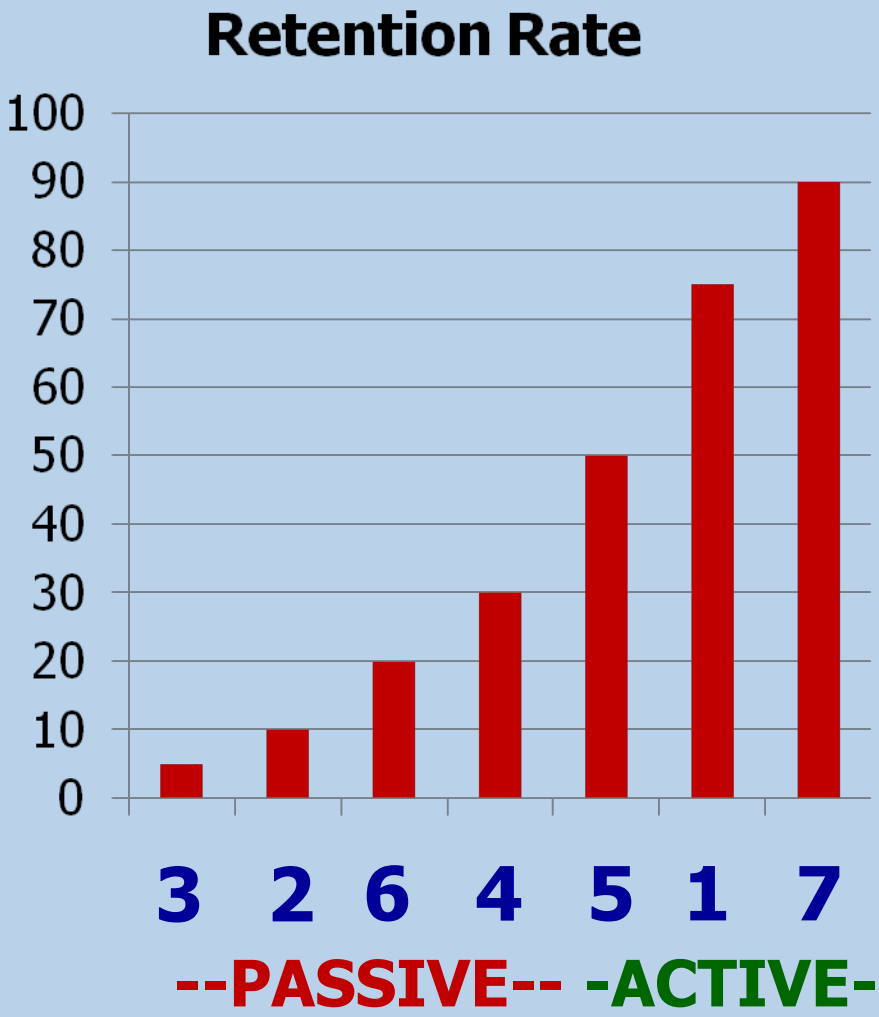
1. We Say It
2. We Hear It and See It
3. We See It
4. We Say and Do It
5. We Read It
6. We Hear It

5 6 3 2 1 4

---PASSIVE--- -ACTIVE-

Robert Pike, 1989; public speaker and adult trainer (Very similar to the Edgar Dale report)

Retention Rates and Instructional Methods



Instructional Method

1. Practice by Doing
2. Reading
3. Lecture
4. Demonstration
5. Discussion Group
6. Audio-Visual
7. Teach Others and/or Immediate Use of Learning

Warren (1989) "New Movement Seeks to Replace Rivalry in Class with Team Spirit," Education.

Retention Rates and Instructional Methods

Instructional Method	Retention Rate
Lecture	5%
Reading	10%
Audio-Visual	20%
Demonstration	30%
Discussion Group	50%
Practice by Doing	75%
Teach Others/Immediate Use of Learning	90%

Warren (1989) "New Movement Seeks to Replace Rivalry in Class with Team Spirit," Education.

Facts, Facts, Facts…

- The previous slides were loaded with facts about engagement, most of which are research-based…
- Which information surprised you the most? Why?

What surprised you the most?

The IPI Process for Collecting and Collaboratively Studying School-Wide Engagement Data

What is The IPI Process?

- The Instructional Practices Inventory Process is a set of faculty-led strategies for collecting valid/reliable student engagement data and for collaboratively studying the data with the goal of increasing and enriching learning experiences throughout the school.
- The process serves a school best when teacher-leaders are the data collectors and the facilitators of the faculty collaborative study of the data.
- When implemented with integrity, data analyses document that the process fosters instructional change and organizational learning.

Rationale for Collecting and Studying Engagement As A Faculty

- Student Engagement is clearly linked to student achievement
- Collaborative Conversations are a cornerstone to establishing a learning organization
- Organizational Learning is a key to maintaining currency of knowledge and application of best practices

Development of the Instructional Practices Inventory Process for Profiling and Studying Student Engagement

- When: 1995-96
- Who: Bryan Painter co-developer
- Why: Originally to understand change in instruction and engagement during a two-year comprehensive, systemic school improvement project of 30 schools
- Data today available from thousands of schools representing hundreds of thousands of classroom observations

Data Collection Mental Image: Collect Large Volume of "Snap Shots" of Student Engagement…

Collaborative Study Mental Image: Faculty Analyze the Data, Problem Solve, and Design for Change

The IPI process…

- provides the opportunity to create an OPTIMUM profile of student engagement in learning…
- that teachers will view as fair and accurate, and thus…
- use as a basis for periodic reflective, problem-solving, collaborative conversations.

The IPI does not profile the types of instructional activities in which students are engaged.

The IPI profiles how students are engaging in learning during the instructional activities.

The Six IPI Student Engagement Categories

Pre-2004: 18-20% Post-2004: 13-15%

Synthesis,
Creativity/Innovation
Critical Analysis
Problem Solving
Analysis

18-20%

6 All Other H-O/D Engagement

3-5%

5 H-0/Deeper Verbal Learning Conversations

APA 14 Learner-Centered Principles; ES: Construct Meaning; HS: Socratic

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30-40%

4 Students are attentive to teacher-led instruction

Recall
Memorization
Skill Practice
Fact-Finding

25-30%

3: Teacher is attentive to, engaged with, or supportive of students

30-40%

3

Independent or group work designed to build basic understanding, new knowledge or pertinent skills

2

2: Teacher is not attentive to, engaged with, or supportive of students

5-10%

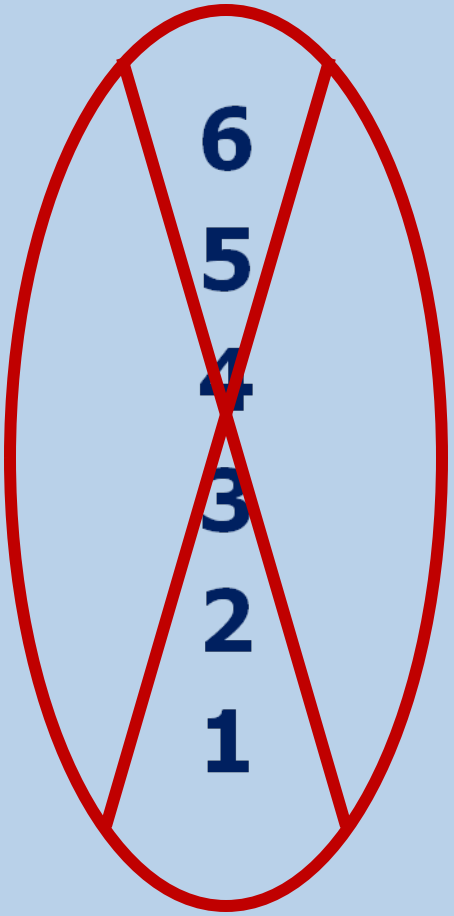
Disengagement

3-5%

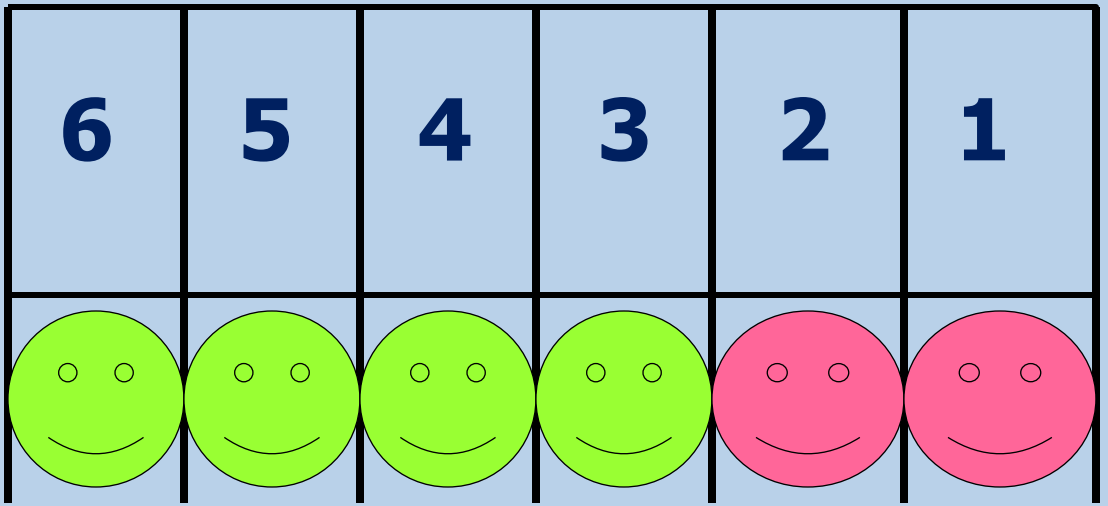
1 Students are not engaged in learning directly related to the curriculum

High Achiev: 0-1%
Low Achiev: 8+; 10+; 20+

What does this visual imply about the six IPI Categories ?



NOT A HIERARCHY



Six distinct categories…ways of classifying how students are engaged. A 6 is not better than a 5; a 5 is not better than a 4; etc. A 5 is not better than a 3, it is different than a 3 and there are times when the 3 is the most appropriate learning experience for the students.

In a lesson or a unit, categories 6, 5, 4, 3 are all valuable learning experiences for the students.

Influences on Achievement?

6 5 4 3 2 1

Which category has the single-most influence on student achievement? **1**

Which two categories when combined have the most negative impact on student achievement? **1 2**

Which two categories when combined have the most positive impact on student achievement? **5 6**

The relative impact of 1-2 vs 5-6 is devastating… Categories 1-2 have slightly more than 2 times the influence of categories 5-6 on achievement in most grades.

H-O/Deeper Development

6 All Other H-O/D Engagement

5 H-0/Deeper Verbal Learning Conversations

Synthesis, Creativity/Innovation
Critical Analysis
Problem Solving
Analysis

Knowledge/Skill Development; Not H-O Deeper

4 Students are attentive to teacher-led instruction

Recall
Memorization
Skill Practice
Fact-Finding

3 3: Teacher is attentive to, engaged with, or supportive of students

Independent or group work designed to build basic understanding, new knowledge or pertinent skills

2 2: Teacher is not attentive to, engaged with, or supportive of students

NOT Engaged

1 Students are not engaged in learning directly related to the curriculum

Typical Engagement Percentages from the IPI Data before IPI Process Implementation (Data from 2004-2009 …the NCLB era)

What schools (grade-levels) have the highest percentages of Higher-Order/Deeper Engagement?

	Typical Percentages:
Early Childhood	**18.4%**
Elementary	**17.4%**
Middle	**16.5%**
High	**15.5%**
Voc-Tech	**35.1%**
Alternative HS	**21.8%**

What schools (grade-levels) have the lowest percentages of Student Disengagement?

	Typical Percentages:
Early Childhood	**1.3%**
Elementary	**3.1%**
Middle	**3.9%**
High	**6.2%**
Voc-Tech	**2.2%**
Alternative HS	**2.3%**

Typical Percentage--2004-2009 (> 46,000 Class Obs.)

IPI Category	EC	ES	ML	HS	V-T-C	Alt.
6	13.37	13.29	11.45	11.30	29.99	15.39
5	5.06	4.09	5.06	4.24	5.14	6.43
4	46.88	44.12	39.71	37.60	25.51	32.88
3	28.53	28.62	30.71	29.08	31.58	35.54
2	4.86	6.80	9.13	11.62	5.62	7.49
1	1.30	3.08	3.93	6.16	2.16	2.27
5-6	18.43	17.38	16.51	15.54	35.13	21.82
2-3	30.69	35.42	39.85	40.70	37.20	43.03
4-5-6	65.31	61.50	56.22	53.14	60.64	54.70
1-2-3	34.69	38.50	43.78	46.86	39.36	45.30

Practice Coding Examples to Develop an Understanding of the Categories in the Classroom

Classroom Coding Examples…

- Read the example and chat briefly with your neighbor…what do you think is the correct code?
- 1—2—3—4—5—6

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IPI Example A

As you enter the 8th grade science classroom, the students are listening attentively to the teacher give them simple directions for the litmus experiment they will begin in a few minutes. The teacher explains the process step by step. You learn from two students that the class also did litmus tests last month. As you begin to leave the room the teacher is re-explaining the main points of the process.

Which of the IPI categories should be coded for this example?

IPI Example A

As you enter the 8th grade science classroom, the students are listening attentively to the teacher give them simple directions for the litmus experiment they will begin in a few minutes. The teacher explains the process step by step. You learn from two students that the class also did litmus tests last month. As you begin to leave the room the teacher is re-emphasizing the main points the students are to recognize and the steps they are to take when they do the litmus test.

IPI Code: Category 4—Students are attentive to Teacher-Led Instruction

H-O/Deeper Development

6 All Other H-O/D Engagement

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Synthesis, Creativity/Innovation
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IPI Example B

As you enter the sophomore English classroom, the students are creating (original) poems. The teacher is moving among the students encouraging them as they work. They have a rubric on their desks that clarifies expectations about rhyme, meter, imagery, content, emotion, and length. The students are defining a topic and creatively explaining it through poem. As you read their work, you are impressed with their depth of thought and emotion.

Which of the IPI categories should be coded for this example?

IPI Example B

As you enter the sophomore English classroom, the students are creating (original) poems. The teacher is moving among the students encouraging them as they work. They have a rubric on their desks that clarifies expectations about rhyme, meter, imagery, content, emotion, and length. The students are defining a topic and creatively explaining it through poem. As you read their work, you are impressed with their depth of thought and emotion.

IPI Code: Category 6—Students are engaged in Higher Order/Deeper, Creative thought

H-O/Deeper Development

6 All Other H-O/D Engagement

5 H-0/Deeper Verbal Learning Conversations

Synthesis, Creativity/Innovation
Critical Analysis
Problem Solving
Analysis

Knowledge/Skill Development; Not H-O Deeper

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IPI Example C

As you enter the 4th grade math class the students are seated at their tables completing a workbook assignment. When you look at their work you see they are independently computing practice division problems. They have been doing these types of problems off and on for months. The teacher is working at her computer creating a test and has her back to the students.

Which of the IPI categories should be coded for this example?

IPI Example C

As you enter the 4th grade math class the students are seated at their tables completing a workbook assignment. When you look at their work you see they are independently computing practice division problems. They have been doing these types of problems off and on for months. The teacher is working at her computer creating a test and has her back to the students.

IPI Code: Category 2—Students are engaged in practice seatwork and the teacher is not attentive to, engaged with, or supportive of their work.

H-O/Deeper Development

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IPI Example D

As the you enter the freshman honors history class, the students are watching selected segments of the movies Pearl Harbor and Midway. The students are not taking notes, just watching. The teacher is standing by the DVD/VCR player watching the segments with the students. You can tell from the books on the students' desks that the class is studying WWII. You are in the room about two minutes.

Which of the IPI categories should be coded for this example?

IPI Example D

As the you enter the freshman honors history class, the students are watching selected segments of the movies Pearl Harbor and Midway. The students are not taking notes, just watching. The teacher is standing by the DVD/VCR player watching the segments with the students. You can tell from the books on the students' desks that the class is studying WWII. You are in the room about two minutes.

IPI Code: Category 3—Students attentive to video resource and teacher is attentive to students

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IPI Example E

As the you enter the high school art class, the students are in small groups of four or five. Each group has a print of a classic painting and the students are discussing their analyses of the paintings. The discussions are stimulated by two "why" and "what if" questions written on the board that require collective analysis of the artwork. One student in each group is taking notes for the group. As you begin to leave the room two minutes after entering, you hear the teacher say that it is time to explain their group analyses and defend them to the whole class.

Which of the IPI categories should be coded for this example?

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IPI Code: Category 5—Students engaged in higher-order verbal learning conversations

H-O/Deeper Development

6 All Other H-O/D Engagement

5 H-0/Deeper Verbal Learning Conversations

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Analysis

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IPI Example F

As the you enter the first grade class, 12 of the 17 students are organized in two reading groups of 6 each on one side of the room. Each student is reading silently. A parent volunteer is circulating among the two groups to help as needed with difficult words. When you talk quietly with a few of those students and the parent, you learn that the students have challenging stories to read and they are working on developing reading skill and story comprehension. The teacher is in the opposite side of the room reading softly to the other five students.

Which of the IPI categories should be coded for this example?

IPI Example F

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IPI Code: Category 6—Non readers learning to read and comprehend requires at least analysis to obtain meaning from the sentences.

H-O/Deeper Development

6 All Other H-O/D Engagement

5 H-0/Deeper Verbal Learning Conversations

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NOT Engaged

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IPI Example G

As you enter the fourth grade language arts classroom it is obvious that the 24 students are taking a paper and pencil test. The teacher is seated at a student desk near the back of the room observing the students as they take the test. You walk among the students for a few moments to read some of the test items. The test is a "recall" test, of multiple choice and fill in the blank items. The test is still in progress when you leave the classroom two minutes after entering the room.

Which of the IPI categories should be coded for this example?

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IPI Code: Category 3—Students are engaged in recall-level seatwork with the teacher attentive to the students.

Collecting Engagement Data with Validity and Reliability

Procedures for Collecting Engagement Data with Validity and Reliability so Teachers View the Data as Fair and Accurate

- Systematically move from classroom to classroom based upon the floor plan of the school.
- Observe all learning settings proportionately across the school.
- Code student learning during the first moments of initial entry into classroom as if you took a snapshot upon entry.
- Focus on students, not the teacher.
- Code the predominant engagement pattern
- Collect a large volume of data points throughout the school day

Procedures for Collecting Engagement Data with Validity and Reliability so Teachers View the Data as Fair and Accurate

- Conduct data observations on "typical" school days.
- Have candid faculty discussions about "jazzing-it up" on data collection days.
- Select higher-numbered code when a clear picture between two codes is not evident.
- Code during regular learning time, not during transitions between content areas.
- Protect anonymity of all observations; never link an observation with a teacher.

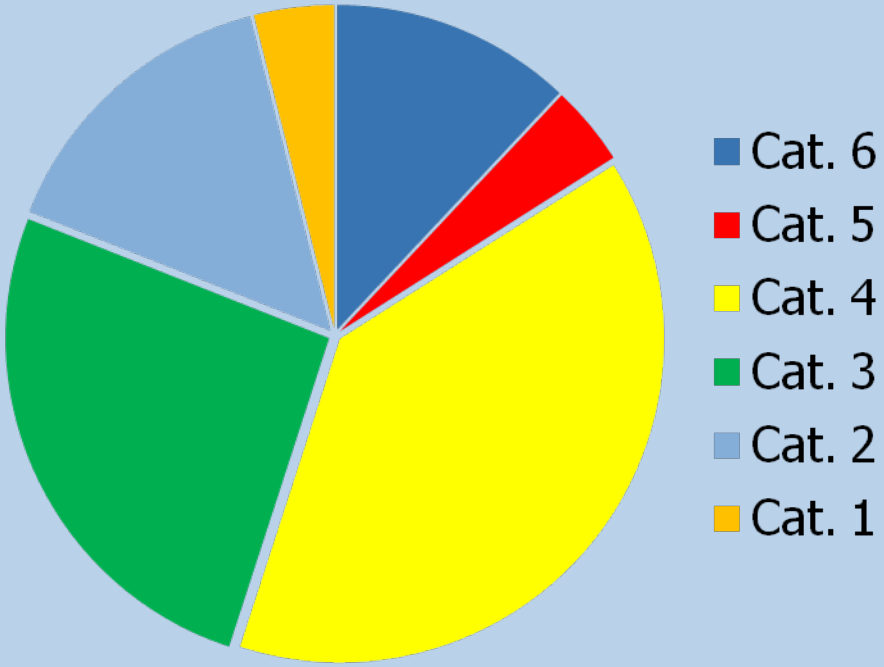
Who Should Collect the Data?

- **Teacher-Leaders Should Collect the Data**
  - Observations provide teachers with broader perspective about learning
  - Teachers are not evaluators
  - Faculty embrace data more quickly when teachers collect the data and facilitate conversations about the data
  - Each school should develop an IPI Team of 3-5 teacher leaders
- **Regional Office and State Support Staff Can Help**
  - Short-term strategy to build interest/comfort
  - Most impact occurs when a school builds internal capacity to collect and study the data
  - Long-term support in design of faculty work sessions
- **Principals are capable of Collecting Data for Profiles, however, the process usually fails because…**
  - Teachers link principal's observations with evaluation
  - Teachers perceive the IPI process as an "administrator-driven" process
  - Teacher ownership is critical to consistent day-by-day changes in instructional design…and teacher ownership does not occur if staff view the process as administrator-driven

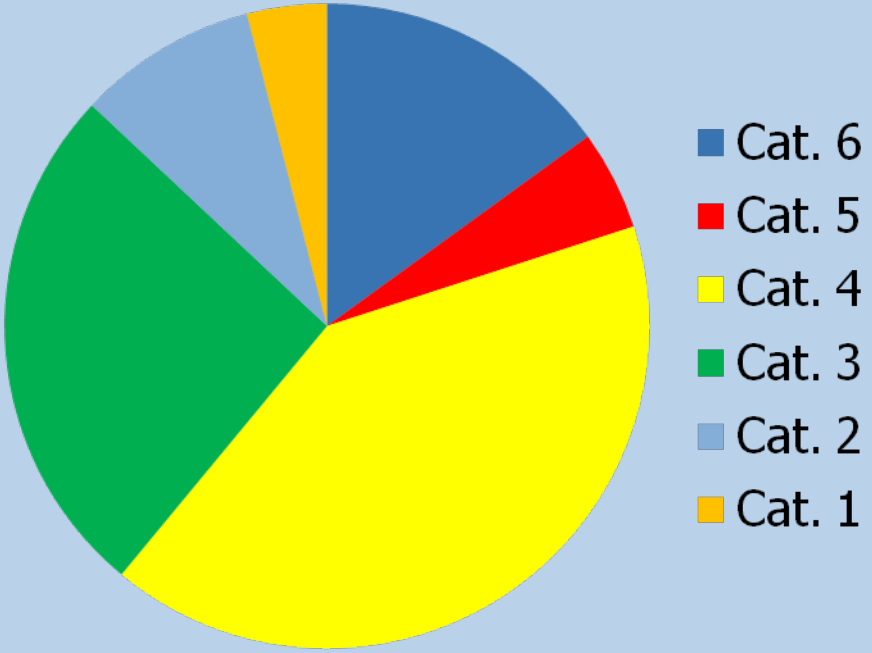
Collaborative Faculty Study of the IPI Data

Collaborative Faculty Study of the IPI Data…Core, Non-Core and Total Pie Charts

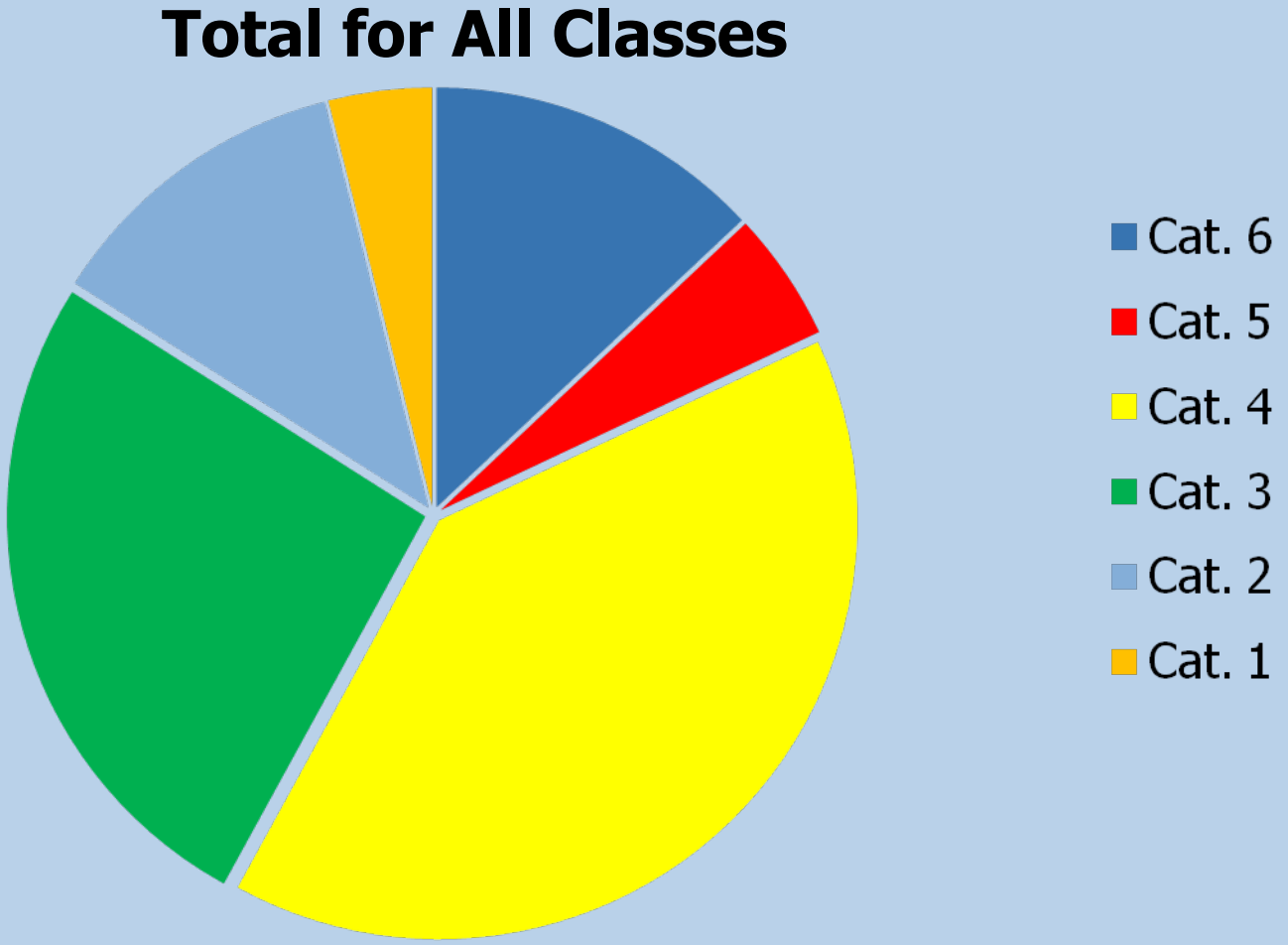
Core Classes



Non-Core Classes



Collaborative Faculty Study of the IPI Data…Core, Non-Core and Total Pie Charts



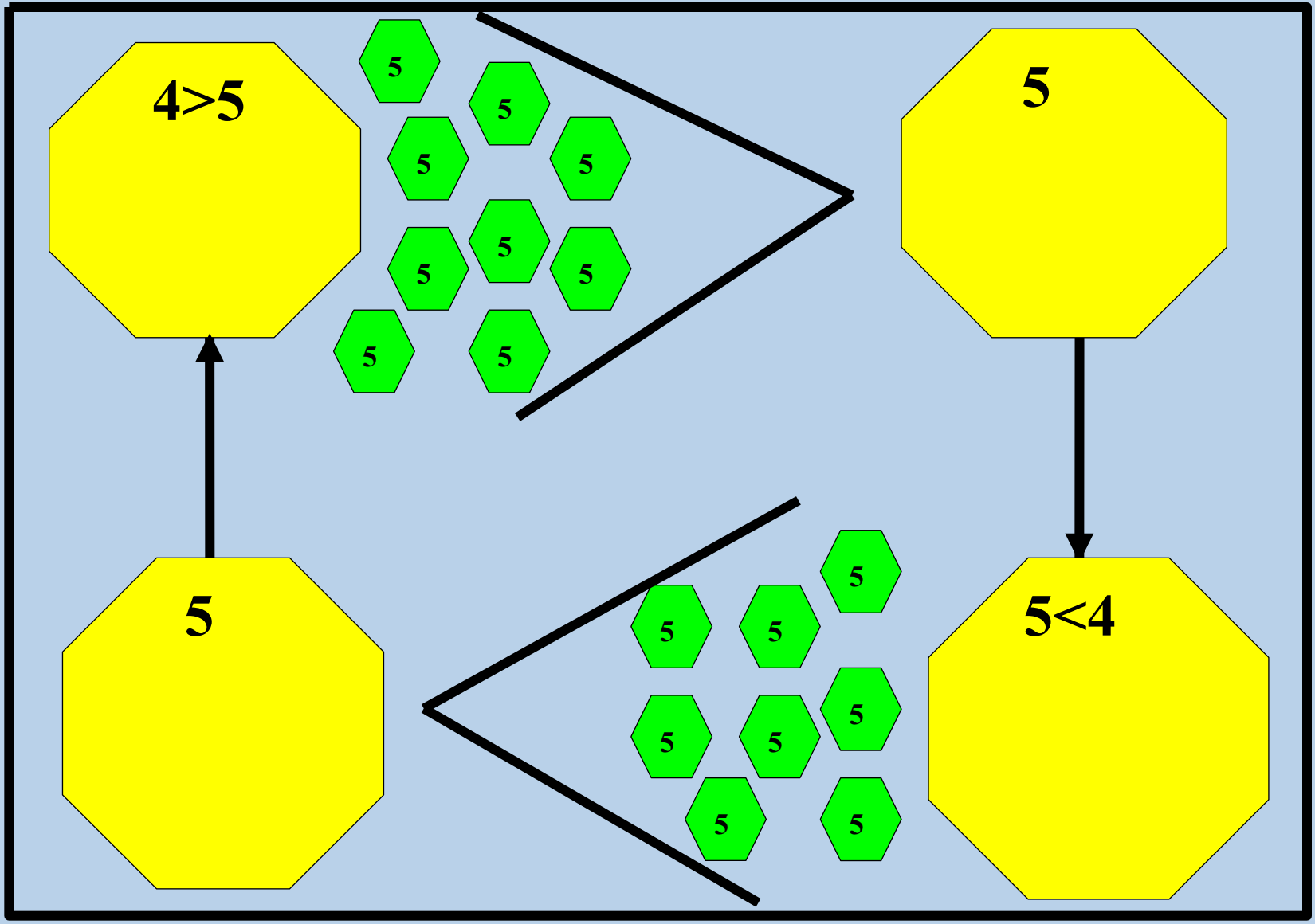
Keys to Studying the Data

- Use multiple short (45-50 min) study sessions
  - Study in a timely manner…compared to waiting weeks for a professional development day
- Control the study environment…
  - arrange setting with tables for small groups
  - permit faculty to be seated with friends
  - after beginning the session, number-off the teachers to mix them randomly
  - create small groups of 5-6 teachers per group
- Use Whole Group and Small Group Strategies
  - Think of the faculty meeting as an opportunity to model good "category 5" engagement in learning

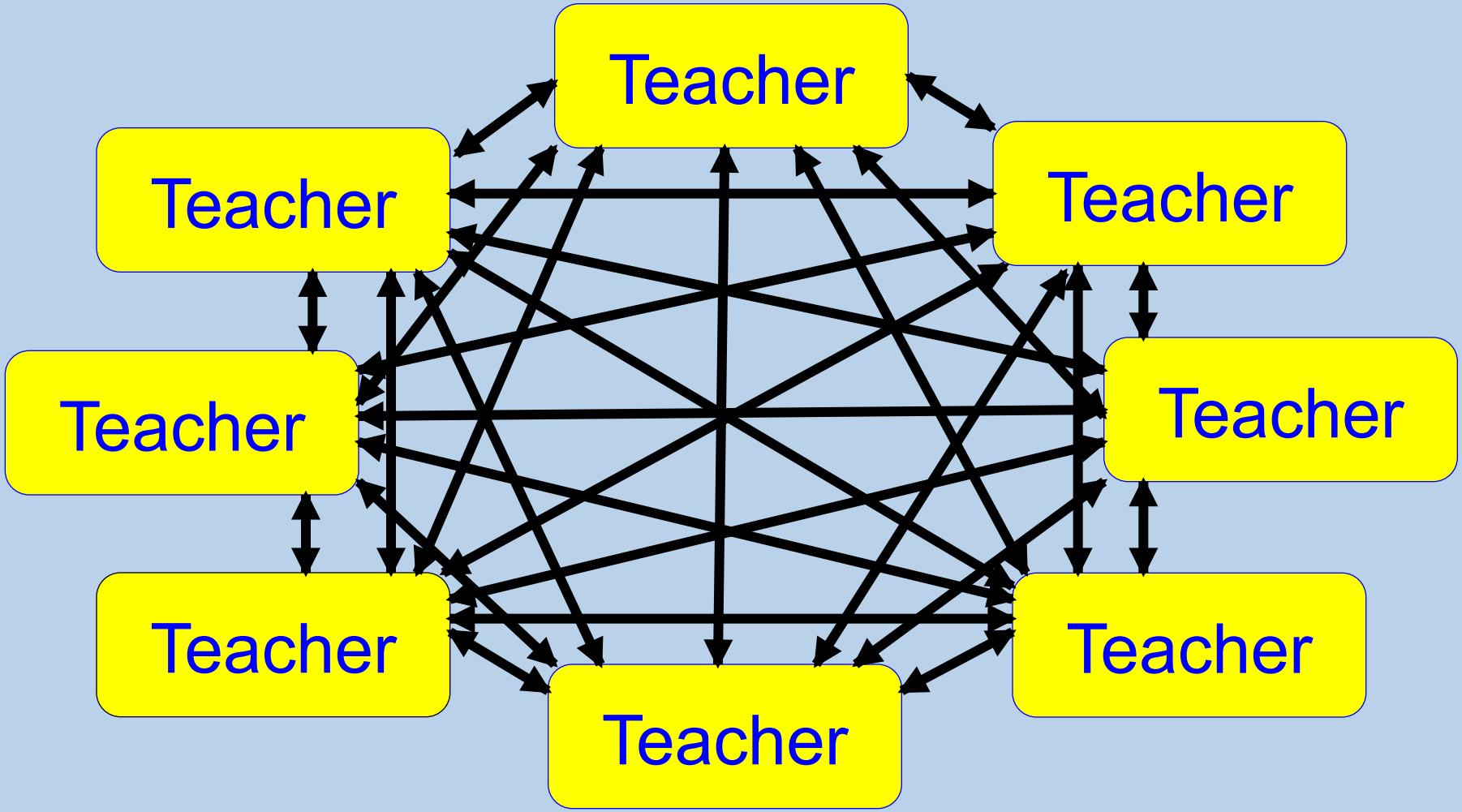
Common Elements for Each IPI Faculty Collaborative Conversation

- Discuss Typicality
  - Of School day
  - Of Instructional classroom practices (Jazz-it-up effect?)
- Compare current and prior profiles…define issues to celebrate and issues of concern that need to be addressed
- Build new knowledge about engagement strategies
- Conclude session with discussion of value/worth of session…reflection/meta-cognition
- Facilitate the collaborative study in whole group setting and small group settings with whole group share-out (make the learning a “5”)

Can You Interpret this Image of a Highly Collaborative Faculty Study Session???



Higher-Order Faculty Collaborative Learning Conversations?



Powerful learning yet under-utilized in faculty study

Collaborative Conversations Impact Student Learning

(Valentine, 7-2010)

ORGANIZATIONAL LEARNING

Collaborative Conversations
We learn to study and problem-solve together as a faculty

Trust Grows

Collective Commitment Grows
We are getting on the same page and learning from each other

PSYCHOLOGY OF LEARNING

Student Self-Efficacy Increases I believe I can learn this and I will learn it

Student Academic Success

Faculty Collective Efficacy Grows
We believe we can and we believe we are "making a difference"

Students Realize They Are More Successful Learners
I can see my successes and I like it

INSTRUCTIONAL BEST PRACTICES

Thinking and Talking about Engagement Strategies become more Common
Consciously design units and lessons with

Instructional Activities that Engage Students more Effectively Increase
Disengagement declines; Higher- Order/Deeper Engagement Increases

Student Academic Success is more Prevalent
An expectation that students will succeed becomes the norm throughout all classrooms

Learning Communities can be like Silos…where knowledge, like grain, is isolated, stored. knowledge is not transferred to other silos. Collaboration/sharing/cohesion are missing.

IPI Longitudinal Study (1996-2008)

Overview of 2009 Study

- Data from 1996 to 2008 were compiled in 2008-2009 and analyzed using descriptive statistics, correlations and regressions, hierarchical linear modeling, and structural equation modeling.
  - 243 schools from 105 school districts
  - More than 550 days of data collection produced more than 70,000 classroom observations
  - 125 of the 243 Schools completed a detailed "process" survey allowing us to study "integrity to the recommended procedures"
- Factors studied included
  - Variables beyond the control of the school (e.g. FRL, % minority)
  - Variables within the control of the school (e.g. teacher educational level, teacher experience, instructional practices)
- Dependent Variables
  - Student Achievement (Math and Communication Arts)
  - Instructional Practices (higher-level and non-higher-level engagement)

Higher-Order/Deeper Engagement and Achievement

- A 20% increase in Higher-order/Deeper levels of engagement (categories 5-6) is projected to produce, on the state's high-stakes achievement test, a:
  - 6% increase in Communication Arts scores
    - i.e. a school with 50% of students passing the CA portion of the test would have 56% passing
  - 7.3% increase in Mathematics scores
    - i.e. a school with 50% of students passing the Math portion of the test would have 57.3% passing

Disengagement and Seatwork with Achievement

- A 20% increase in categories 1-2-3 is projected to produce, on the state's high-stakes achievement test, a:
  - 7% decrease in Mathematics
    - i.e. a school with 50% of the students passing the Math portion of the state test would go down to 43% pass rate

Interesting Middle School Data

- Reducing student and teacher disengagement in middle schools is twice as impactful on achievement as is increasing higher-order thinking.
  - In middle schools, an increase in student disengagement and teacher disengagement during seatwork (Categories 1-2) by 20 percent reduces the percent of students passing the state test by approximately 10%...
  - Changing HO/D (Categories 5-6) engagement enough to make a 10% upward swing in achievement pass rates would require an increase of approximately 41 percent

Interesting High School Data

- For high schools, reducing student and teacher disengagement is even more impacting on achievement than in middle schools, while increasing HO/D is comparable on state achievement tests.
  - In high schools, an increase in student/teacher disengagement and seatwork (Categories 1-2) to 20 percent reduces the percent of student passing the state test by approximately 14%...
  - Changing HO/D (Categories 5-6) engagement enough to make a 14% upward swing in Communication Arts achievement pass rates would require an increase of approximately 45 percent

High Implementation Integrity, FRL & Achievement

- Schools that implemented the IPI with integrity did not see the same degree of negative influence of FRL on state achievement scores compared to schools that implemented the IPI with low integrity.
  - In short, achievement in schools with high levels of IPI integrity are not as negatively impacted by poverty as would otherwise be the case.

Key Components of High Implementation of the IPI Process

- Multiple data collections per year
- Collaborative faculty study of the data following each data collection
- Data collection by teachers
- Faculty collaborative study of the data led by teachers
- Level of faculty receptivity (openness) to the IPI process during initial stages and subsequent stages

Faculty Receptivity to the IPI Process before Beginning Data Collections

- Using a five-point scale to measure faculty receptivity to the IPI process:

Low	L-M	Moderate	M-H	High
1	2	3	4	5

- A school with the highest receptivity to the IPI data collection and collaborative conversations process before the first data were collected is projected to have 6% higher levels of HO/D engagement over schools with low-moderate receptivity

Faculty Receptivity to the IPI Process after the First Data Collection/Conversation

- Using a five-point scale to measure faculty receptivity to the IPI process:

Low	L-M	Moderate	M-H	High
1	2	3	4	5

- A school with the highest receptivity to the IPI data collection and collaborative conversations process after their first data collection and collaborative study is projected to have 12% higher levels of HO/D engagement and teacher directed learning compared to schools with low-moderate receptivity

Keys to Early Faculty Receptivity

- Develop a team of teacher leaders to collect data
- Teacher leaders explain, and engage the faculty in discussing, the process before beginning the IPI process
- Faculty are aware of the dates when IPI data will be collected
- Teacher leaders maintain integrity during and after data collection
- Teacher leaders facilitate the faculty study of the data
- Principal facilitates and actively supports and encourages the process

Frequency of Data Collection and Collaborative Study Make a Difference

10 data collections

followed by collaborative conversations

over 3 years equated to…

- 14% increase in higher-order/deeper engagement (Categories 5-6)
- **AND**
- 13% decrease in disengagement and seatwork (Categories 1-2-3)

Keys to Data Collections

- Collect data quarterly
- Build the 4 dates/times for faculty study into school calendar
  - Work backward from the dates when data can be studied by the faculty as the basis for selecting the days data will be collected
  - Collect data approx. one week prior to time when faculty will study the data

The True Value of the IPI Process Resides in the…

- faculty collaborative conversations following each data profiling in which
- teachers constructively study the data, problem solve, strategize, and learn together
- as they collectively work to raise the bar of instruction across the whole school.

Let's Sum it up…ENGAGEMENT

- Document engagement using a valid and reliable observation process
- Categories 3-4-5-6 are each important for Learning throughout a unit and/or lesson
- Eliminate Disengagement (1)
- Reduce Teacher Disengagement (2)
- Reduce Seatwork (2-3)
- Increase HO/D Engagement (5-6)
- Increase HO/D Verbal Learning Conversations (highly powerful process for learning) (5)

Let's Sum it up…
Collaborative Learning Conversations

- Teacher leaders are the appropriate data collectors and should collect the engagement data in their own schools
- Data collectors must be certificated to ensure validity and reliability.
- Teacher leaders, with support from principals, should "facilitate" the study of the data
- Multiple data collections and collaborations per year are necessary for meaningful, long-term change
- Each faculty collaborative study session should:
  - Discuss typicality during the data collection process
  - Study data profiles and define issues to address
  - Build new knowledge per defined issues
  - Reflect on the value of the collaborative learning experience
  - Develop commitment and learning by engaging staff meaningfully in small/whole group learning conversations!

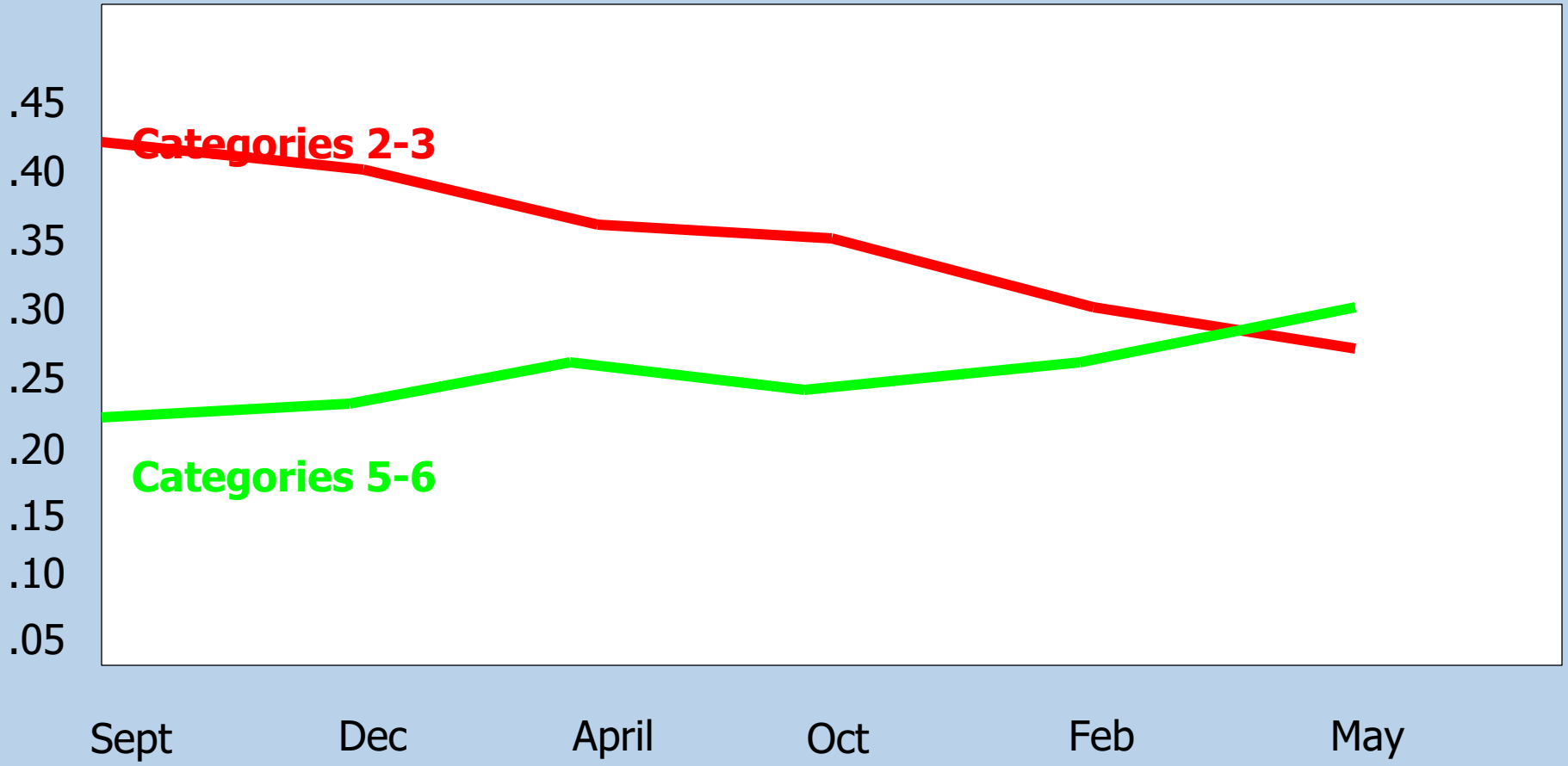
Recommended Annual Events

- Based upon our most recent research about successful use of the IPI, collect and study data three or four times a year.
- The following is a recommended timeline:
  - Early Fall—review process and categories; prep new faculty; revisit "jazzing-it-up"
  - Between school start and holiday break—collect profiles twice and have collaborative conversations as soon as possible after each collection
  - Between holiday break and spring break, collect profile data and have collaborative conversation
  - Near the end of school year, collect profile data and have collaborative conversation.

Key IPI Reflective Questions After Year One of Implementation

- How many times have IPI data been collected?
- How many times have IPI data profiles been studied/discussed by the faculty?
- Before the first IPI data collection, did the faculty discuss the IPI process?
- If so, who led the discussion?
- How receptive to the use of the IPI was the faculty before the first data collection?
- How receptive to the use of the IPI was the faculty after the first data collection?
- How receptive to the use of the IPI is the faculty today?
- Did the faculty study/discuss the IPI profiles after each data collection?
- Who has been leading the study/discussion of the profiles?
- When the faculty discussed the data, how were the discussions organized?
- Generally, who collects the data for the IPI profiles?
- Overall, who has provided the leadership for the faculty study/discussions of the data?
- Overall, what have been the outcomes from the faculty's study/discussion of the data?
- Overall, what has been the faculty's attitude/receptivity toward the IPI process?

Longitudinal Effect…



Collaborative Higher-Order Learning Conversations prepare students for life!

If time…discuss the following about school change.

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Professor Emeritus
University of Missouri

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References

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- Gauen, K. (2009). *The Impact of the Instructional Practices Inventory on an Illinois Middle School*. Unpublished doctoral dissertation, Lindenwood University.
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- Valentine, J. (2010).) *Establishing a Faculty-wide Collaborative Study of Student Engagement*, National Association of Secondary School Principals, Annual Conference, San Diego, CA March 14, 2010.
- Yair, G. (2000). Not just about time: Instructional practices and productive time in school. *Educational Administration Quarterly, 36(4), 485-512.*

Suggested Resources…

- For more detailed information about the IPI see **Instructional Practices Inventory: Profiling Student Engagement for School Improvement** *(Valentine, 2005) available from* ***ValentineJ@missouri.edu.***

- For more detailed information about Project ASSIST see **Frameworks for Continuous School Improvement: A Synthesis of Essential Concepts** (Valentine, 2001) and Project ASSIT Research paper presented at available at AERA, April 2006 in San Francisco*) available from* ***ValentineJ@missouri.edu.***

- Also see The Instructional Practices Inventory: Using a Student Learning Assessment to Foster Organizational Learning *Valentine, 2007, also 2009 NSDC Annual Convention paper) available by request from* ***ValentineJ@missouri.edu.***

- For information about IPI Level I (Coder Training) and Level II (Advanced Faculty Work Session) workshops *email* ***ValentineJ@missouri.edu.***

IPI Coder Reliability is Developed through IPI Level I Workshop

- Minimum Reliability for user endorsement:
  - .80 for site-based school improvement data
  - .90 for research
- Coder Reliability Study
  - w/o Workshop .05-.20 Reliability avg: .17
  - With Workshop .80-1.0 Reliability avg: .93

If you would like a copy of this PowerPoint presentation…

- Email me at ValentineJ@Missouri.edu
- Request the PPT by date and location of the presentation
- I will reply and attach a copy of the PPT plus the handouts and a couple of manuscripts about the IPI.
- For information about IPI Workshops in your area, contact me by email.

Questions, contact the IPI developers at:

Website: www.MLLC.org

Email: valentinej@missouri.edu

Phone: (573) 882-0944

Additional Slides of Interest…Lack of time prevented these slides from being used in the presentation

- The following slides may have some value for understanding the IPI process. They have been used in different presentations over time about the IPI and/or student engagement in learning.

Recommended Resources

- www.APA.org "Learner-Centered Psychological Principles (1997)
- "Powerful Learning (ASCD and www.ascd.org; (Brandt 1998)
- Marzano, et al. (ASCD):
  - The Art and Science of Teaching (2007)
  - Classroom Instruction that Works (2001)
  - Designing and Assessing Educational Objectives (2008)

What does it take to change engagement?

	Sequence of Payoff	What it Takes
6	(3) Combined Categories 5-6: All HO/D	New Knowledge Implementation Skill Commitment
5		
4		
3		
2	(2) Categories One Plus Two: All Disengagement	Awareness Commitment
1	(1) Most Direct: Stu. Disengagement	Awareness Commitment

Overall Implementation of the IPI Process Recommended Practices for Data Collection and Collaborative Conversations

- Using a five-point scale to measure school implementation of the recommended practices:

Low	L-M	Moderate	M-H	High
1	2	3	4	5

- A school implementing the IPI recommended practices with high integrity is projected to have 8.4% higher levels of HO/D engagement over schools with low-moderate implementation

Higher Order/Deeper Engagement
vs.
Not Higher Order/Surface Engagement

Analysis, Critical Thinking, Problem Solving, Decision Making or Application from Analysis, Creativity, Innovation Synthesis

---

Recall, Memorization, Fact Finding, Simple Understanding, Practice to Internalize Skills or Processes

6 – Student Active Engaged Learning (HO/D)

- Higher-Order/Deeper thinking through analysis, problem solving, critical thinking, creativity, innovation, and synthesis.
- **Common Examples (if HO/D):**
  - Inquiry-based approaches such as project and problem-based learning, research and discovery learning
  - Authentic demonstrations
  - Independent metacognition, reflective journaling, and self-assessment
  - Higher-order responses to higher-order questions.

5—Student Learning Conversations (HO/D)

- Higher-Order Student-Student Verbal Learning Conversations constructing deeper meaning and understanding through the conversations
- **Common examples (if HO/D):**
  - collaborative or cooperative learning
  - Peer tutoring, debate, and questioning
  - Partner research and discovery/exploratory learning
  - Socratic learning
  - Small group or whole class analysis and problem solving, metacognition, reflective discussions or writing, and self assessment

4—Teacher-Led Instruction (Not HO/D)

- Students are attentive to teacher-led instruction as the teacher leads the learning experience by disseminating content knowledge and/or directions for learning
- **Common Examples:**
  - Teacher-directed Q/A, lecture, explanations
  - Teacher direction giving
  - Teacher demonstrations

3—Student Work with Teacher Engaged (Not HO/D)

- Students engaged in independent or group work designed to build basic understanding, new knowledge, pertinent skills. Teacher is attentive to, engaged with, or supportive of the students' work.
- **Common Examples: (Teacher Engaged)**
  - Fact finding
  - Building skill or understanding through practice, seatwork, worksheets, chapter review questions
  - Multi-media

2—Student Work with Teacher Not Engaged (Not HO/D)

- Same as Category Three except the teacher is not attentive to, engaged with, or supportive of the students' work.
- **Common Examples: (Teacher Not Engaged)**
  - While students are working, teacher is:
    - Out of the room
    - Working at computer
    - Grading papers

1—Students Not Engaged in Learning

- Students are not engaged in learning directly related to the curriculum
- **Common Examples:**
  - Students talking, daydreaming, or otherwise inattentive
  - Students misbehaving
  - Students not doing their assigned work

Activities that are typically Higher-Level Learning

- Common Examples:
  - Project-based learning
  - Research/Hypothesizing/Testing/Concluding/Defending
  - Questioning…Why, What if, Compare/Contrast
  - Socratic Seminars
  - Thinking about thinking...metacognition
  - Cooperative Learning
  - Problem-based learning
  - Reflective Discussions and Writing Tasks
- Less common examples…how do you make these higher-order?
  - Watching and analyzing a movie
  - Paper/pencil tests
  - Dodge ball!

Why are Higher-Order Learning Conversations so Significant?

- Learning is enhanced through social interaction. When students engage in H-O learning conversations the benefits are:
  - Motivation to learn (social nature)
  - Depth of knowledge and understanding
  - Breadth of knowledge and understanding
  - Recall of knowledge and concepts
  - Transfer of knowledge and concepts

Recommended Annual Events

- Based upon our most recent research about successful use of the IPI, collect and study data three or four times a year.
- The following is a recommended timeline:
  - Early Fall—review process and categories; prep new faculty; revisit "jazzing-it-up" effect
  - Between school start and holiday break—collect profiles twice and have collaborative conversations as soon as possible after each collection
  - Between holiday break and spring break, collect profile data and have collaborative conversation
  - Near the end of school year, collect profile data and have collaborative conversation.

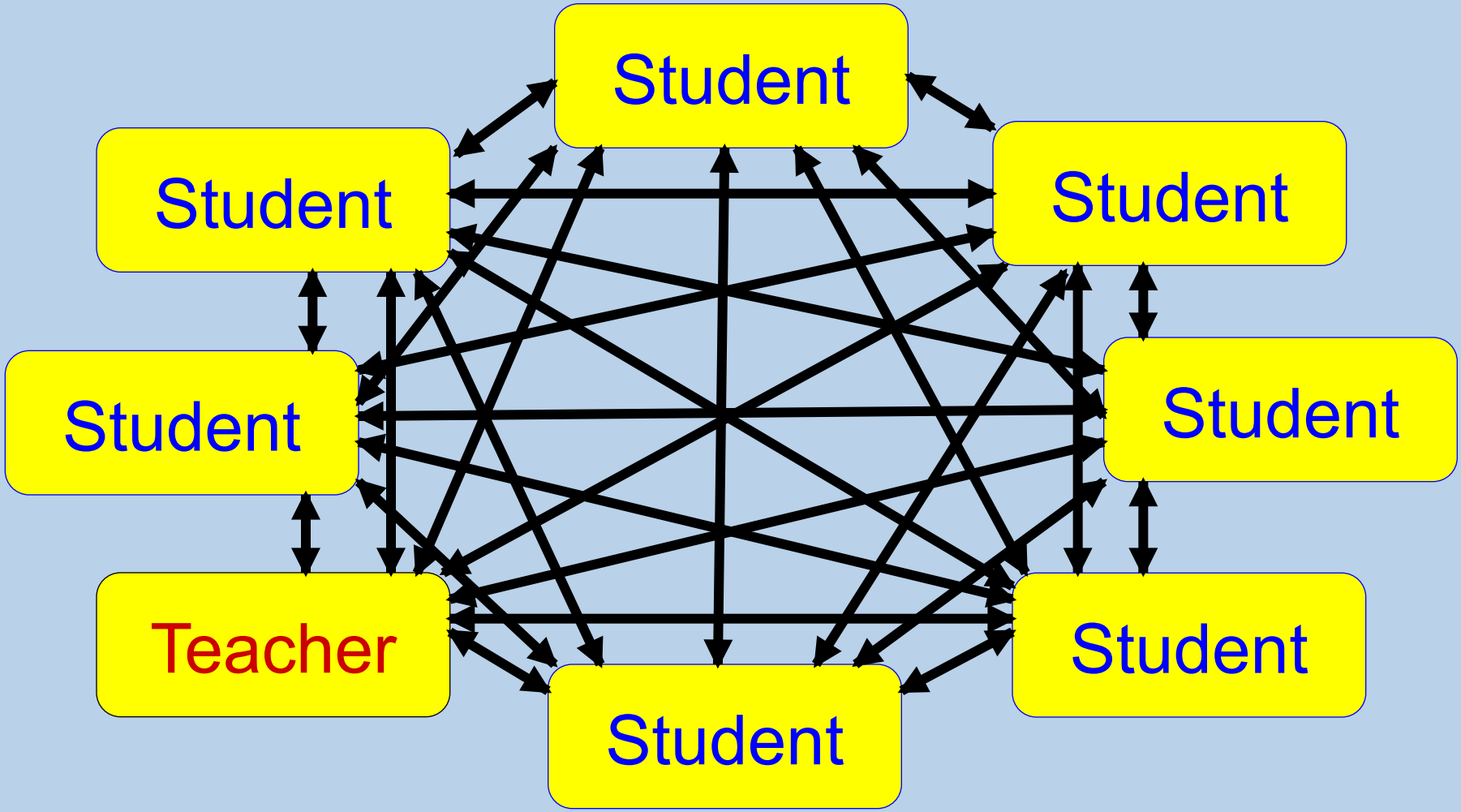
Recommended Year One Timeline/Tasks

Aug/Sept	Sept/Oct	Nov/Dec	Jan/Feb	Apr/May
Orient new faculty; remind old	Data collection; collaborative conversation	Data collection; collaborative conversation	Data collection; collaborative conversation	Data collection; collaborative conversation
Discuss: ■Categories ■Process ■Jazz-it-up ■Not Evaluation	Discuss: ■Typicality ■Celebration ■Issues ■Value	Discuss: ■Typicality ■Compare ■Categories 5-6 Examples ■Homework ■Value	Discuss: ■Typicality ■Compare longitudinally ■Categories 5-6 Examples ■Value	Discuss: ■Typicality ■Compare longitudinally ■Set goals for next year ■Value

Commonalities to Each Faculty Collaborative IPI Conversation

- Typicality
  - School day
  - Instructional classroom practices
- Comparison of profiles
- Substantive learning experiences
- Value or worth…reflection, meta-cognition
- Facilitation of issues from whole group to small group to whole group share-out

Higher-Order Student Classroom Learning Conversations?



Powerful learning yet under-utilized

Faculty Work Session: Analysis and Discussion of the Profile Data

- **Small and Whole Group Analyses and Discussion**
  - **What do we see in the profiles that we can feel good about or celebrate?**
  - **What do we see in the data profiles that we should be concerned about and thus study and discuss more deeply?**
  - **How do we build a cache of good ideas on engagement, especially good HO/D engagement?**
- **Faculty Discussion: Are these types of data valuable to us?**

Faculty Work Session: Post-session Requests

- **Request for sub-group analyses…**
  - **Can we have a profile for the math program?**
- **Individual teacher self-assessment…**
  - **Can I build a profile of my students' engagement using this process?**
  - **Value/benefit of self-ratings vs. accuracy/reliability of self-ratings?**

Faculty Work Session: Deeper Analyses with Longitudinal Perspective and Goal Setting

- **How do we begin to share knowledge about effective strategies that will change the percentages?**
  - **Small groups collaboratively brainstorm good examples of categories 5-6 used in past week (create examples from within…)**
  - **Move conversation to whole faculty sharing**
  - **Move conversations after faculty meeting to sub-groups such as content areas, teams, or grade levels**
  - **Type and share all examples with all faculty**

Faculty Work Session: Goal Setting after three or four data collections…

- For each category percentage, should we:
  - Increase?
  - Maintain?
  - Decrease?
- If change is appropriate…
  - How much?
  - By when?
- What do we address first that will have the most direct impact on student learning?

"Typical" Profiles…not norms

- Are there differences between typical profiles by grade levels, (elem., middle, and high school)?
- Are there differences between typical profiles for core and non-core classes?
- Are there differences between profiles for more effective and less effective schools?

IPI Protocol Examples for Data Collection

- Data observations on "typical" days
- Systematically move from classroom to classroom based upon the floor plan of the school
- Focus on students, not the teacher
- Code student learning during first moments of observation
- When observation is borderline between two codes, select higher code
- Code during regular learning time, not transitions between content areas
- Classrooms of special education and student teachers are observed and coded
- Classrooms of substitute teachers are coded and included in profile if higher-order learning
- All observations are anonymous

Active-Passive Engagement

- What are some examples of ACTIVE STUDENT ENGAGEMENT in learning?
- What are some examples of PASSISVE STUDENT ENGAGEMENT in learning?
- Being actively engaged does not necessarily mean good learning!

IPI Process

- **Fits Concept of Learning Organizations**
  - **Faculty Discussions/Analysis of Data about Teaching/Learning**
    - "Teachers engaged in the data collection"
    - "Teachers engage in regular, reflective collaborative conversations about the data profiles."
    - "On-going collection and collaborative problem-solving conversations over time."

An effective student engagement profiling process:

should…

- Create an optimum profile of engagement teachers will view as fair and accurate
- Provides the basis for reflective, collaborative conversations
- Provide baseline data and insight about subsequent changes in engagement
- Support school improvement and professional development plans
- Serve as a basis for action research
- Be used in context with multiple measures of student success
- Reflect how students are engaging in learning

should not…

- Be associated with staff evaluation
- Identify individual teachers or classes
- Be collected by administrators
- Reflect the activity in which the students are engaged

The following four slides are data from the Justin Collins study, 2009

Number of Collections and Collaborative Conversations with Engagement (Q5)

- If a typical school in this study engaged in 10 data collections and collaborative conversations over the course of three years, the school would have a 13 point decrease in categories 1-2-3 from current average of 38% and a 14 point increase in higher level thinking as measured by categories 5-6 from current average of 22%.

Engagement and Student Achievement

- If a school in the study had a 20% increase in categories 1-2-3 it would have had a decrease in achievement of 7% on Math performance
  - In our study that meant a school at the 42% pass rate would go down to 35% pass rate
- If a school in the study had a 20% increase in categories 5-6 it would have had a 7.3% increase on Mathematics performance
  - In our study that meant a school at the 42% pass rate would go to 49.3% pass rate

N=135

3-level analysis

Faculty Receptivity and Engagement (Q6b)

- If a typical school in this study introduced the use of the IPI in a manner that resulted in a level of receptivity (openness on a 5-unit scale) to the IPI process that was high (5) compared to low-moderate (2), the school would see an increase of 6 points of categories 5-6.

Faculty Receptivity after Initial Analysis and Student Engagement (Q11)

- If a faculty's level of receptivity on a 5-unit scale to the IPI process after the faculty's first profile analysis was high (5) compared to low-moderate (2) the school would see a 12 point gain in the engagement for categories 4-5-6.

Overall Benefits of IPI Process with Engagement (Q14)

- If a typical school in this study engaged in the use of the IPI to the degree that the overall benefits of collaborative conversations and deeper understanding about instructional design increased 3 units on a 5-unit scale assessing overall impact of the IPI on the school culture and instruction, the resultant increase in Core Higher-level engagement would go up 8.4 points from 23 to 31.4%.

Note that the following data are Pre-2005 Data…review and use with caution

Typical Percentages by Grade Levels

	E. S.	M. S.	H. S.
Student Active Engaged Learning	15-25	15-20	15-20
Student Learning Conversations	3-5	3-5	3-5
Teacher-Led Instruction	35-40	35-45	30-40
Student Work with Teacher Engaged	20-30	20-30	15-20
Student Work with Teacher not Engaged	5-10	10-20	15-20
Complete Disengagement	3-8	5-10	5-15

Jerry Valentine 2004

Typical Percentages by Core/Non-Core

	All Levels All Content	All Levels Core	All Levels Non-Core
Student Active Engaged Learning	15-20	<15	<25
Student Learning Conversations	3-5	5-10	<5
Teacher-Led Instruction	30-45	>40	<40
Student Work with Teacher Engaged	20-30	>25	<25
Student Work with Teacher not Engaged	10-20	>20	<20
Complete Disengagement	5-10	>5	<5

Jerry Valentine 2004

Typical Percentages by School Effectiveness

	All Levels All Content	More Effective	Less Effective
Student Active Engaged Learning	15-20	>25	15-20
Student Learning Conversations	3-5	5-10	<5
Teacher-Led Instruction	30-45	35-45	30-40
Student Work with Teacher Engaged	20-30	15-25	>25
Student Work with Teacher not Engaged	10-20	5-10	10-20
Complete Disengagement	5-10	<3	>5

Jerry Valentine 2004

Percentages for High Achieving and Low Achieving Middle Schools

	Highly Achieving	**Low Achieving**	***.001 **.05 *.10**
Student Active Engaged Learning	29.3	16.0	*
Student Learning Conversations	3.3	0.2	***
Teacher-Led Instruction	40.5	33.2	
Student Work with Teacher Engaged	17.3	28.4	***
Student Work with Teacher not Engaged	8.5	13.6	
Complete Disengagement	1.0	8.4	***

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Percentages for High Achieving and Low Achieving Middle Schools

	Highly Achieving	Low Achieving	***.001 **.05 *.10
Student Active Engaged Learning	32.6	16.2	**
Student Learning Conversations			
Teacher-Led Instruction	57.8	61.6	*
Student Work with Teacher Engaged			
Student Work with Teacher not Engaged	9.5	22.0	**
Complete Disengagement			

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Percentages for High Achieving and Low Achieving Middle Schools

	Highly Achieving	**Low Achieving**	***.001 **.05 *.10**
Student Active Engaged Learning	73.1	49.4	***
Student Learning Conversations			
Teacher-Led Instruction			
Student Work with Teacher Engaged	26.8	50.4	***
Student Work with Teacher not Engaged			
Complete Disengagement			

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Activities that Typically produce Higher-Order/Deeper Engagement

- Common Examples:
  - Project-based learning
  - Research/Hypothesizing/Testing/Concluding/Defending
  - Questioning…Why, What if, Compare/Contrast
  - Socratic Seminars
  - Thinking about thinking...metacognition
  - Cooperative Learning
  - Problem-based learning
  - Reflective Discussions and Writing Tasks
- Less common examples…how do you make these higher-order?
  - Watching and analyzing a movie
  - Paper/pencil tests
  - Dodge ball!

Organizational Learning Reduces the Knowledge--Implementation Gap