

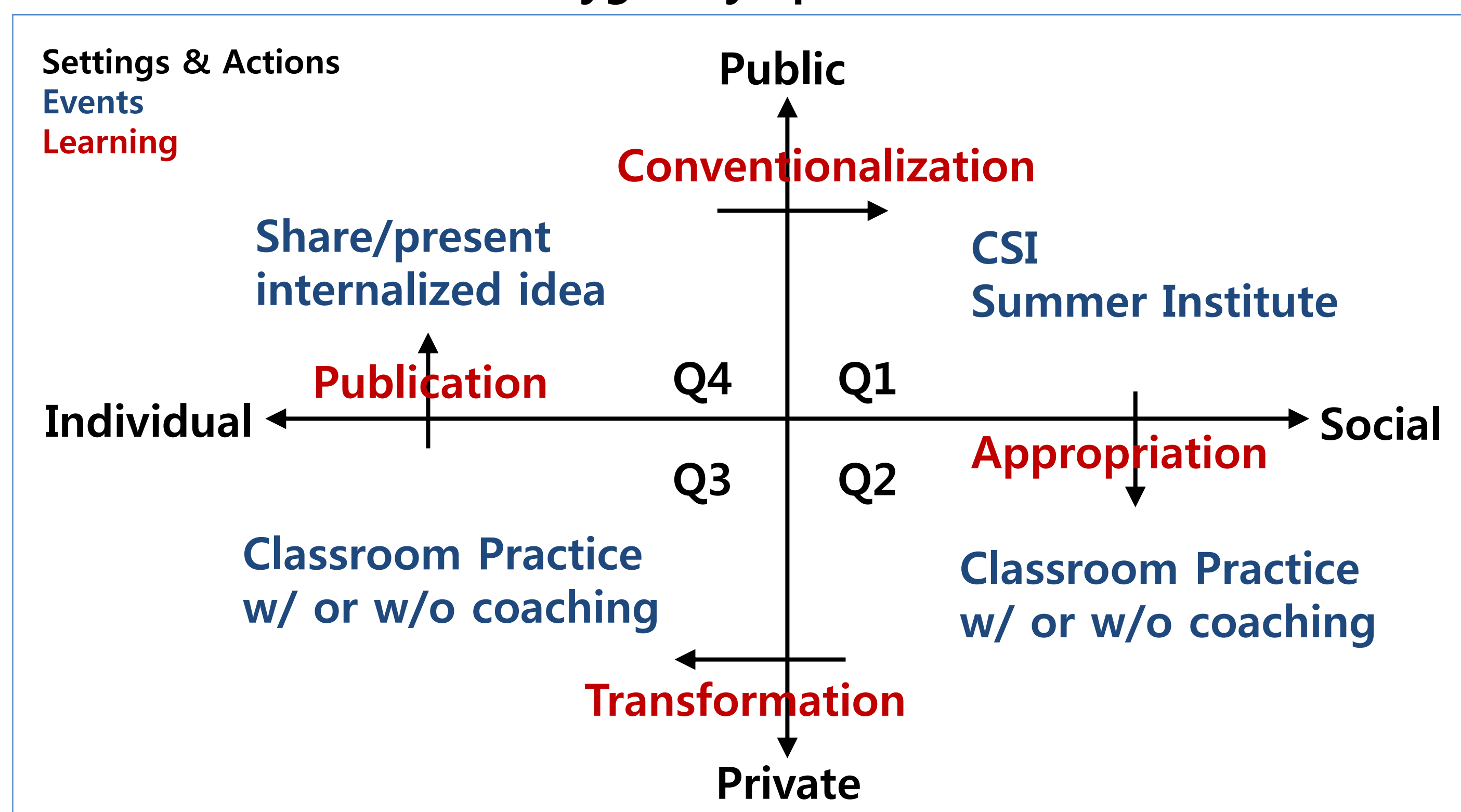
# Case Study: Value-Added Benefit of Distance-Based Instructional Coaching on Science Teacher's Inquiry Instruction in Rural Schools

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## Abstract & Theoretical Framework

**Abstract:** The purpose of this case study was to determine the value-added benefit of coaching over a summer institute alone. The results showed that appropriation and transformation as learning seemed to effectively occur during the coaching sessions.

### Theoretical Framework: Vygotsky Space



## Research Question

- What is **value-added benefit of coaching** science inquiry over a summer institute alone?

## Methods

### Case Study

- Teacher Kara in a Nebraska rural school
- 6 groups of 7<sup>th</sup> grade students
- Teaching the same lessons

### Data

- Teacher & coach interviews
- 11 purposely selected classroom videos
- Timeline of instructional videos analyzed:

Video	Student Group 1	Student Group 3	Student Group 6
Video 1 & 2	3, 4, & 5	6, 7, & 8	9, 10, & 11
May, 2012 Pre-CSI	June, 2012 Summer Institute(SI)	Sep - Oct, 2012 Post-SI and Pre-Coaching	Nov - Dec, 2012 During the Coaching
			Apr - May, 2013 Post-Coaching

### Data Analysis

- **Interviews: Constant Comparative Analysis (CCA)**
- **Classroom videos:**
  - ✓ Teacher Inquiry Rubric (TIR)
  - ✓ Electronic Quality of Inquiry Protocol (EQUIP)
  - ✓ Partial Interval Classroom Inquiry Observation System for Teachers (PICI-T)
  - ✓ Science Classroom Discourse Analysis (CDAT)
- **Inter-rater reliability:** TIR (Kappa = .74), EQUIP (Kappa = .73), and PICI (Kappa = .88)

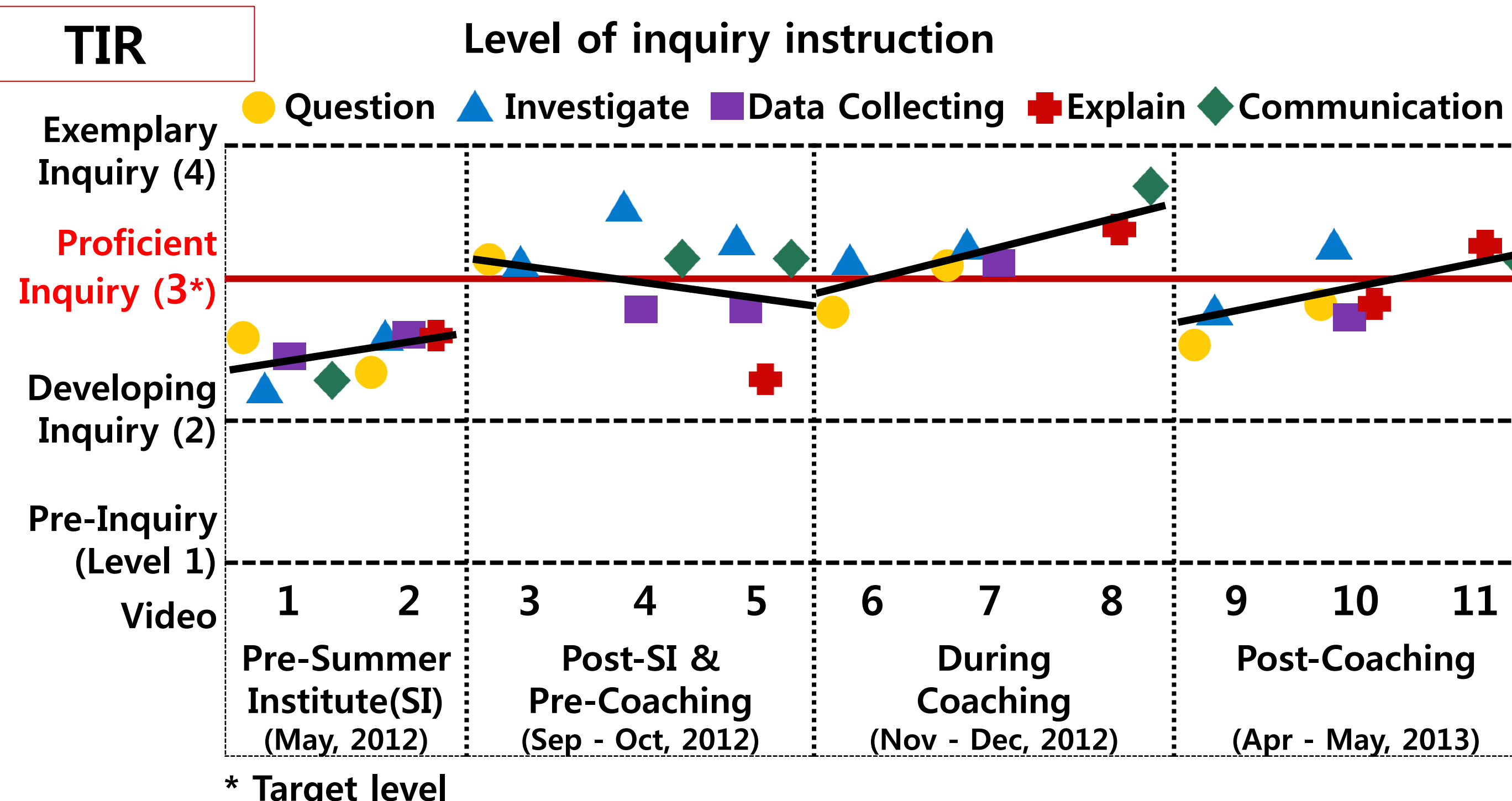
## CSI: Coaching Science Inquiry in Rural Schools

- Randomized controlled trial conducted through IES funded R<sup>2</sup>Ed
- 119 teachers over two years (2012-2014)
- 2-week summer institute (June, 2012 & 2013)
- 8–16 distance-based instructional coaching sessions (2012-2013 & 2013-2014) by 4 CSI instructional coaches
- Video-recorded classroom instruction
- Distance technology delivered coaching

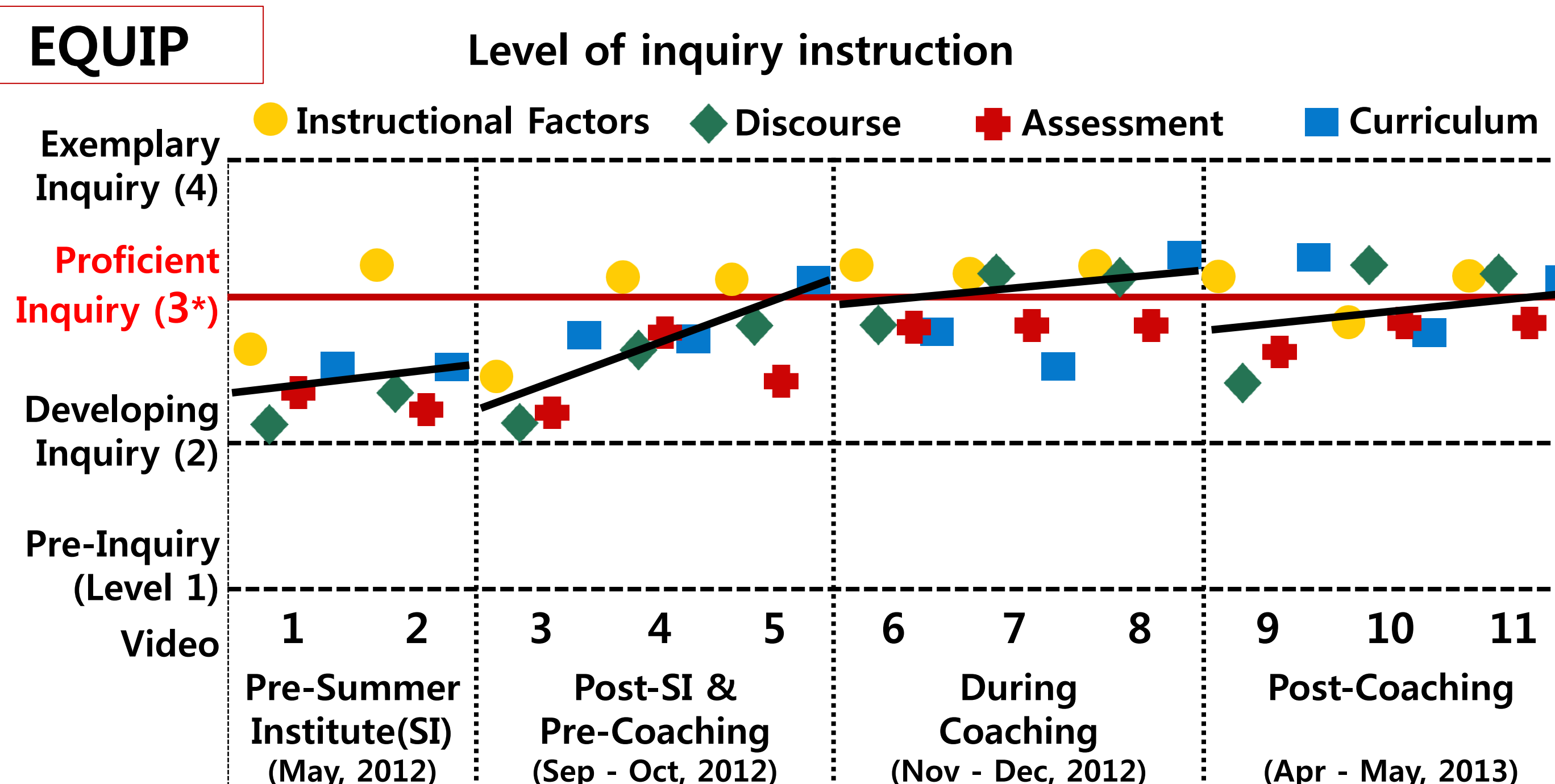


## Case Study Results

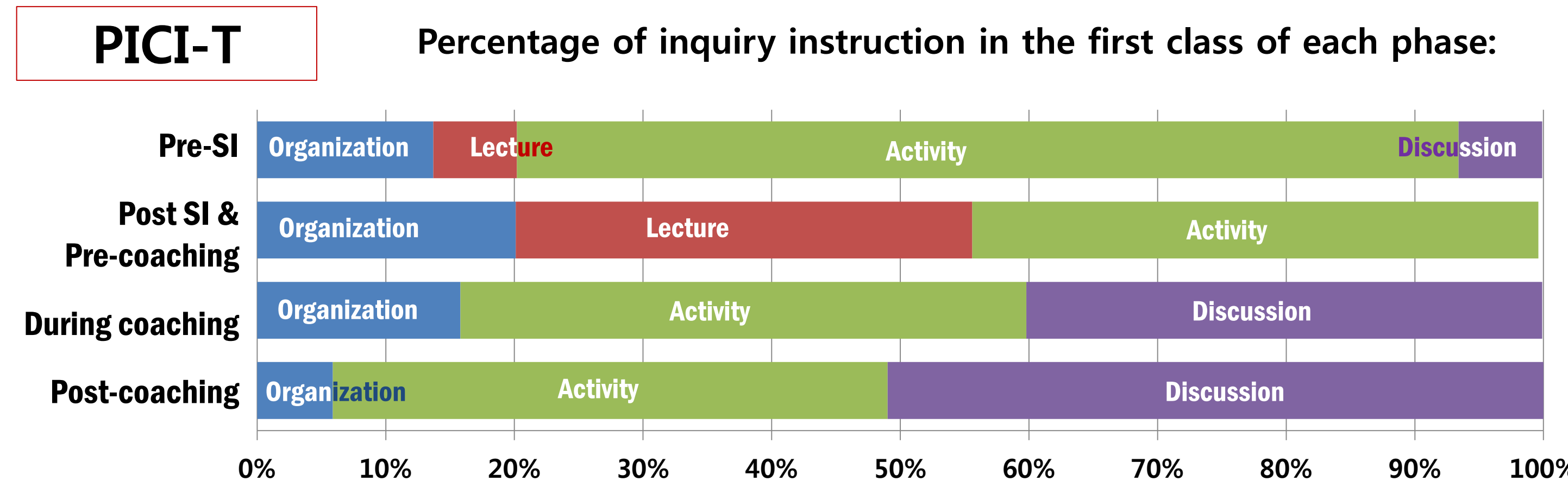
### TIR



### EQUIP



### PICI-T



### CDAT

Classroom discourse analysis of part of a class of each phase:

Discourse Type	Reasoning Component (RC)	Everyday Reasoning (EDR)		Knowledge		Scientific Reasoning (SR)			N/A
		Ss' Explanation	Ss' Experience	Naive Knowledge	Scientific Knowledge	Observation /Data	Patterns from Data	Model/Theory	
Explanation/Examples							6.2		
Question/Prompt						1,2,3,4,5	6,6.1		
Student Response/Question						1,2,3,4,5	6		
Feedback /prompt	L3:Elaborative L2:Corrective L1:Evaluative						1,2,3,4,5	6	

#### ● Pre-Summer Institute

Discourse Type	Reasoning Component (RC)	Everyday Reasoning (EDR)		Knowledge		Scientific Reasoning (SR)			N/A
		Ss' Explanation	Ss' Experience	Naive Knowledge	Scientific Knowledge	Observation /Data	Patterns from Data	Model/Theory	
Explanation/Examples									
Question/Prompt						2,	1,3,3.1,3.2,3.3		
Student Response/Question						2,	1,3,3.1,3.2		
Feedback /prompt	L3:Elaborative L2:Corrective L1:Evaluative						3		

#### ● Post-SI & Pre-Coaching

Discourse Type	Reasoning Component (RC)	Everyday Reasoning (EDR)		Knowledge		Scientific Reasoning (SR)			N/A
		Ss' Explanation	Ss' Experience	Naive Knowledge	Scientific Knowledge	Observation /Data	Patterns from Data	Model/Theory	
Explanation/Examples						2			
Question/Prompt						1, 1.1	2,3, 3.2		
Student Response/Question						1, 1.2	2,2.1, 3, 3.1,3.2, 3.3		
Feedback /prompt	L3:Elaborative L2:Corrective L1:Evaluative					1, q1.2	q2.1, q3.1, q3.3		

#### ● During Coaching

### Interviews

Interview	Time	Learning	Example Quotes
1 (07/31/12)	Post-SI	Appropriation	"I got the impression this summer the way we went through the PD provided was truly how inquiry works."
2 (09/26/12)	Post-SI & pre-Coaching	Appropriation Transformation	"What I now understand [is that] inquiry isn't just a topic, it is a process and a method."
3 (12/19/12)	Post-coaching	Appropriation Transformation	"Now that I've gone through the coaching, all that summer PD really makes sense now and I kind of understand where it was going and how things were done."
4 (05/22/13)	End-of-year	Transformation Publication	"It [inquiry] doesn't have to be hands-on and it has to be good questions so I see it as self-discovery."
Coach (03/08/13)	Post-coaching	Appropriation Transformation Publication	"I think she still had a really good sense from the summer institute." "They [students] didn't confirm their hypotheses. So, that was the big thing we worked on with always tie everything back to where you started."

## Discussion

The value-added benefit of the instructional coaching:

- Level of inquiry instruction increased and maintained
- More discussion with students and less lecturing
- Changes in discourse pattern from IRFIRF to IRRFRFRFR...
- Insightful *Appropriation* and Enhanced *Transformation*