

**San Jose State University**

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May 19, 2014

# The Real-time Instructor Observing Tool for Future Teachers

Cassandra Paul, *San Jose State University*



Available at: <https://works.bepress.com/cassandra-paul/25/>

# The Real-time Instructor Observing Tool (RIOT) for future teachers

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Science Education Program  
San José State University  
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Based on a work at [sjsuriot.appspot.com](http://sjsuriot.appspot.com)

# Have you heard of RIOT?

# What population might you use RIOT with?

- Learning Assistants or Graduate Teaching Assistants
- In-service or Pre-service Teachers
- Faculty



# RIOT for future teachers

- History of RIOT development
  - Motivation
  - Desired components
- RIOT Constructs
  - Categories of Interactions
  - Screen layout
  - Interpreting output
- Using RIOT
  - Try it out!
- Small group activities
  - Comparing RIOT data
  - Creating RIOT classroom activities

# Real-time Instructor Observing Tool

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History and Development

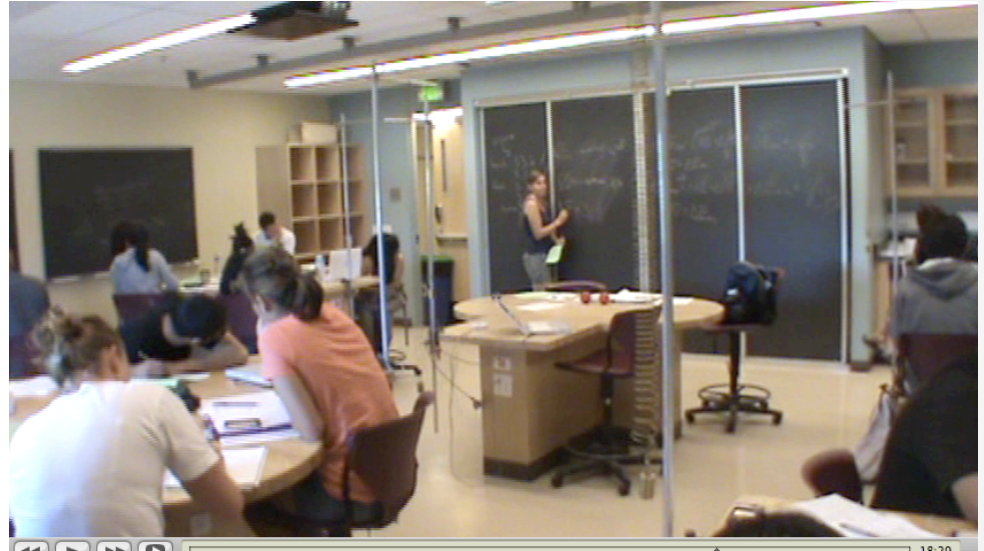
# CLASP

## COLLABORATIVE LEARNING THROUGH ACTIVE SENSE-MAKING IN PHYSICS

2 pieces of CLASP curriculum	Time spent in class per week:	Interactivity:	Number of Students:	Instructors:
Lecture	1x 80 minutes (25 min Quiz)	(sometimes) Peer-Instruction	~150 students (2 sections per course)	Usually faculty, sometimes lecturer or advanced grad
Discussion-Lab	2 x 140 minutes	Series of interactive activities spliced with whole class discussions	30 students (10 sections per course)	The vast majority are grad students.

# DISCUSSION-LAB

## Small Group



## Whole Class

# RIOT Development Drivers

- Teaching Assistants responsible for facilitating discussions on bulk of content in a new learning environment
- Don't have the resources to visit 20-30 classrooms and facilitate one-on-one briefings over the 10 week quarter
- Need a way to support the instructors thinking about their teaching practice
- Facilitate reflection instead of lecturing about learning theory
- What do physics grad students love?
- Data!
-

# RIOT Development

- Interaction categories determined from watching interactive classroom
- RIOT can be used by novice observers with minimal training (good for peer observing)
  - Categories are broad for easy observer coding and observee interpretation
  - RIOT does not require judgment on the part of the observer
- RIOT provides a visual representation of classroom observation data
- RIOT is free!
  - Originally developed with expensive FileMakerPro software
  - Andrew Reid at San José State University developed web-based open source version of RIOT

West, E. A., Paul, C. A., Potter, W. H., Webb, D. Variation of instructor-student interactions in an introductory interactive physics course Phys. Rev. ST Phys. Educ. Res., Vol. 9 (March 2013)

# RIOT Constructs

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# RIOT Categories

Talking At  
Students

Talking With  
Students

Observing  
Students

Not Interacting  
With Students

- Clarifying Instructions
- Explaining Physics
- Listening to Question
- Closed Dialogue w/students
- Open Dialogue w/ students
- Open Dialogue with Ideas
- Passively Observing Students
- Actively Observing Students
- Checking Homework
- Fixing Apparatus
- Out of Room
- Not Interacting/Reading
- Chatting with Students



## Small Group Time

## Whole Class Discussion Time

## Talking at Students

WC	Ind	G1	G2	G3	G4	G5	G6
WC	Ind	G1	G2	G3	G4	G5	G6

Clarifying instructions

WC

Explaining content

WC

## Shared Student/TA dialogue

WC	Ind	G1	G2	G3	G4	G5	G6
WC	Ind	G1	G2	G3	G4	G5	G6
WC	Ind	G1	G2	G3	G4	G5	G6

IDEAS!

Listening to question

WC

Ind

Closed dialogue

WC

Ind

Open ended dialogue

WC

Ind

## Observing Students

WC

G1	G2	G3	G4	G5	G6
----	----	----	----	----	----

Passive: scanning class

Active: listening to one group

Student Presentation

Ind

Students Talking Serially

WC

## Not Interacting with Students

Administrative/Grading

Working on Apparatus/Material

Chatting

Out of Room

Class Prep/Reading TA Notes

## Your Comments:

Submit Comment

End Session

## Small Group Time

### Talking at Students

WC	Ind	G1	G2	G3	G4	G5	G6
WC	Ind	G1	G2	G3	G4	G5	G6

### Shared Student/TA dialogue

WC	Ind	G1	G2	G3	G4	G5	G6
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IDEAS!

### Observing Students

WC							
	G1	G2	G3	G4	G5	G6	

### Not Interacting with Students

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Chatting

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Class Prep/Reading TA Notes

### Your Comments:

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## Whole Class Discussion Time

Clarifying instructions

Explaining content

WC

WC

Listening to question

Closed dialogue

Open ended dialogue

WC Ind

WC Ind

WC Ind

Passive: scanning class

Active: listening to one group

Student Presentation

Students Talking Serially

Ind

WC

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## Whole Class Discussion Time

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IDEAS!							

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WC

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Open ended dialogue

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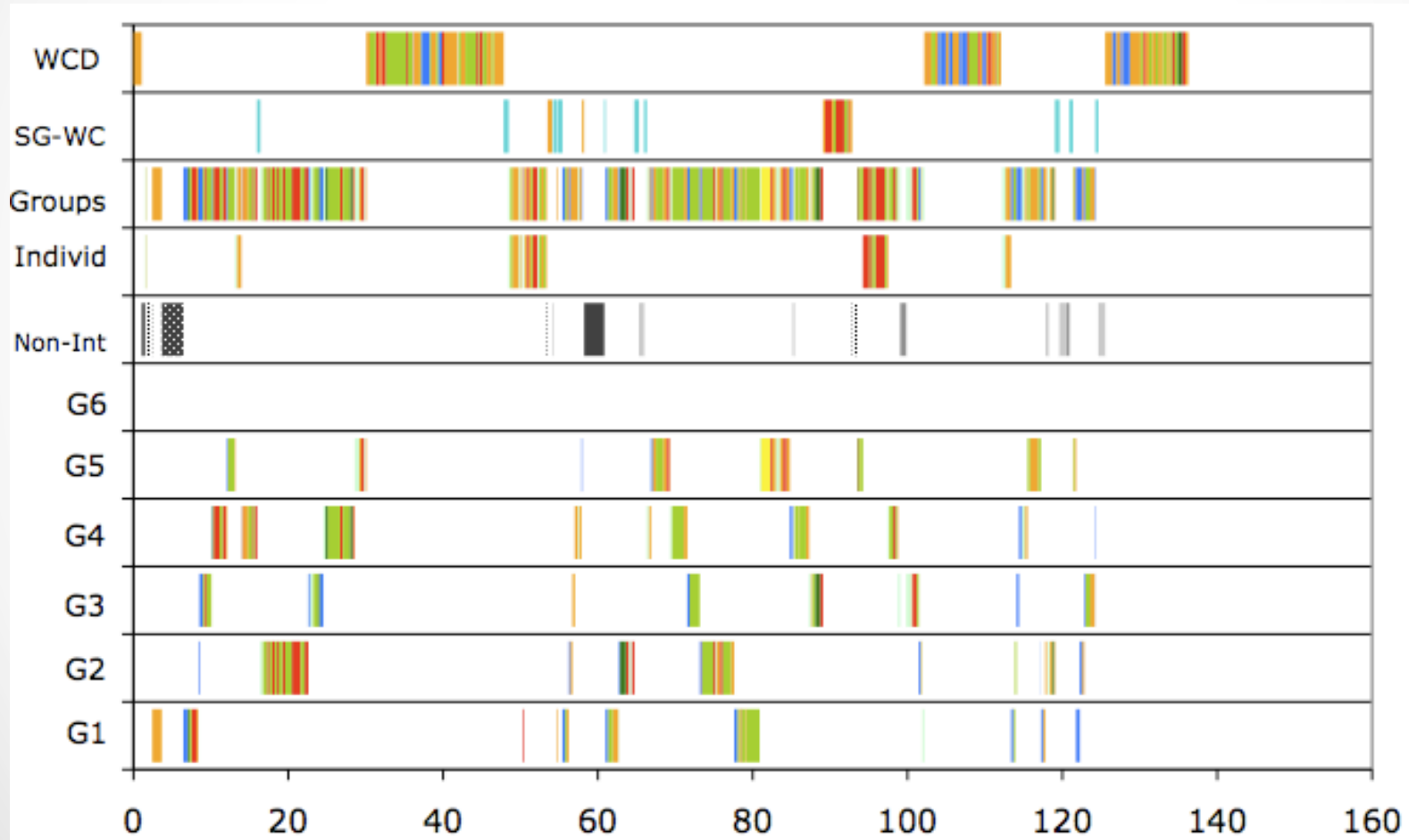
Student Presentation

Ind

Students Talking Serially

WC

# R.I.O.T OUTPUT



# R.I.O.T. OUTPUT EXPLAINED BY ROW

TA is Interacting w/ Whole Class

TA is interacting w/ Whole Class during time when students are in small groups

TA is interacting w/ Group 1

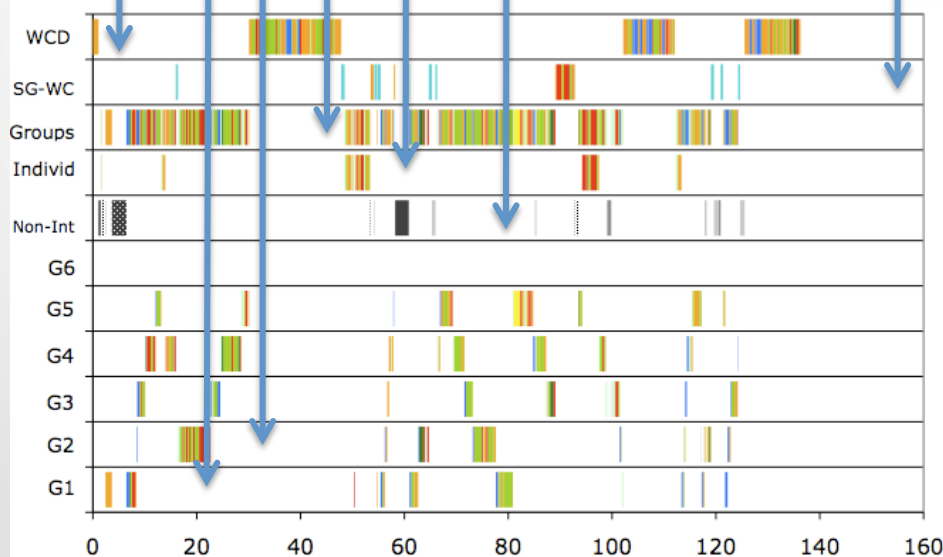
TA is interacting w/ Group 2

Sum of all Group rows

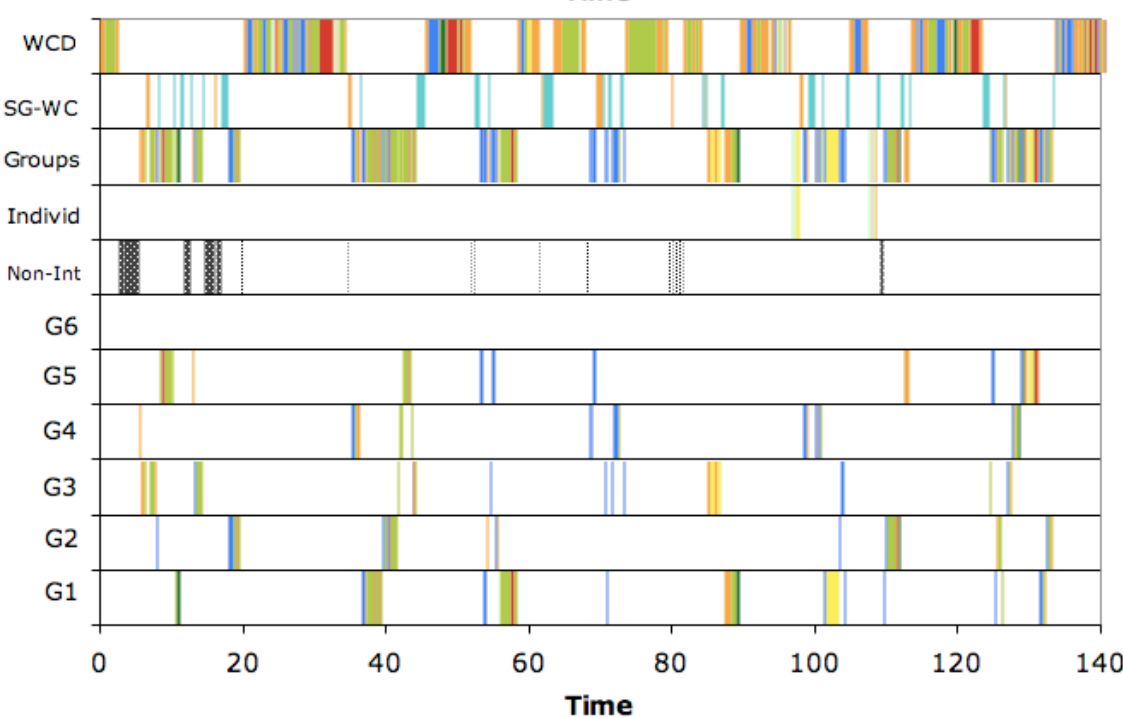
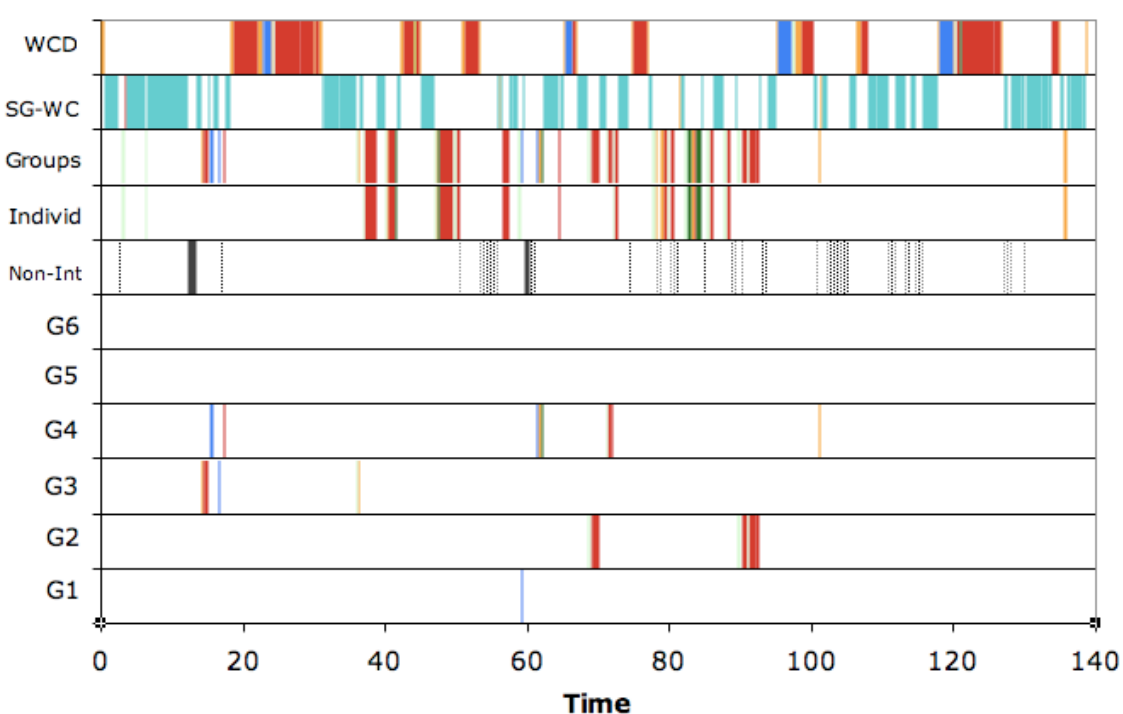
TA is interacting with individual

TA is not Interacting

- Clarifying Instructions
- Explaining Physics
- Listening to Question
- Closed Dialogue w/students
- Open Dialogue w/ students
- Open Dialogue with Ideas
- Passively Observing Students
- Actively Observing Students
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- Fixing Apparatus
- Out of Room
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- Chatting with Students



Time in minutes →



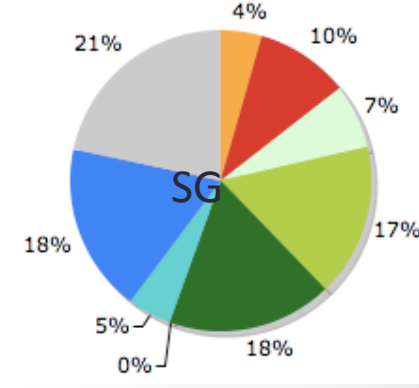
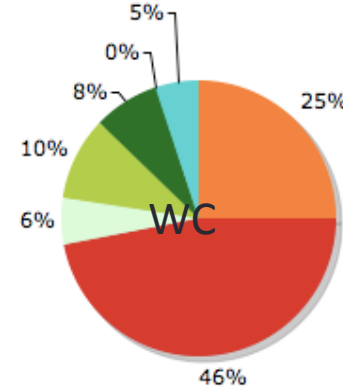
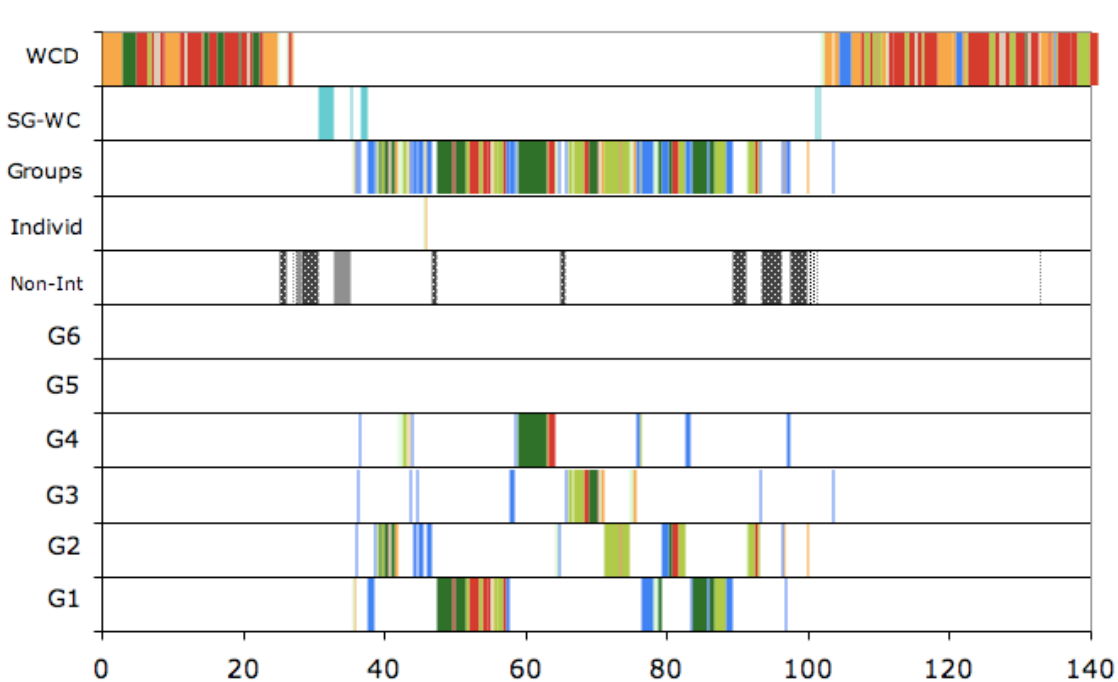
## Sodium

7A DLM 17 3/12/2008

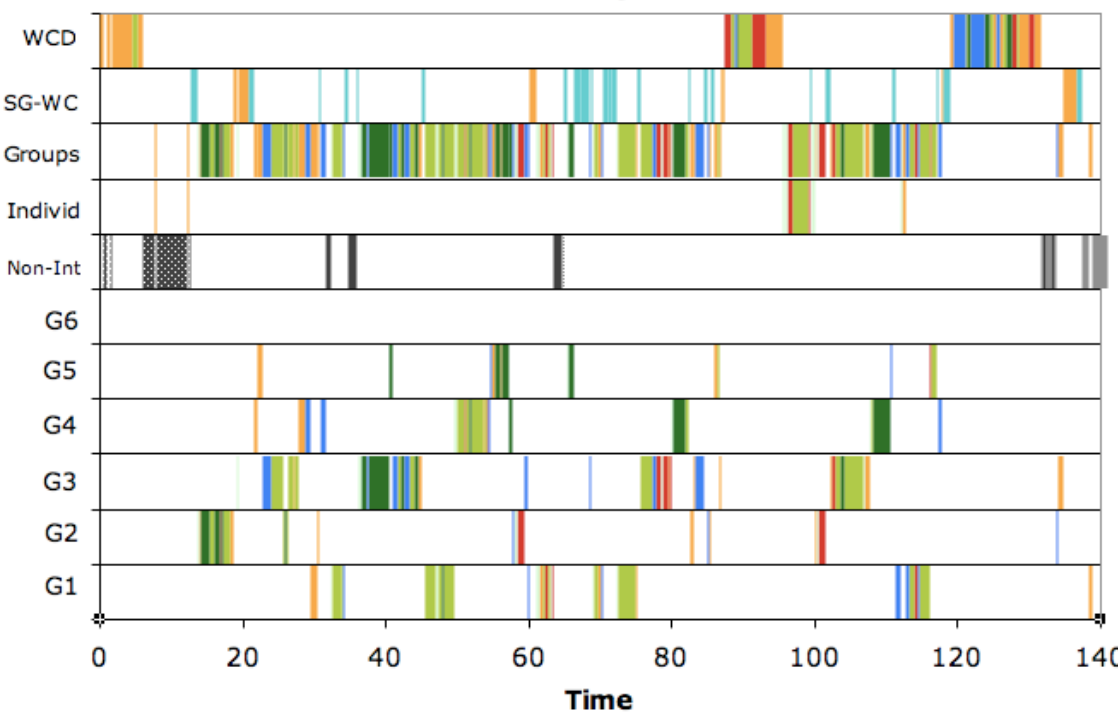
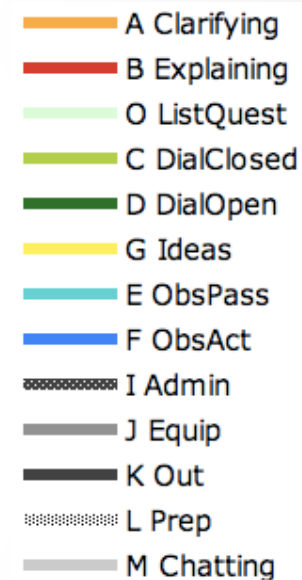
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## Silicon

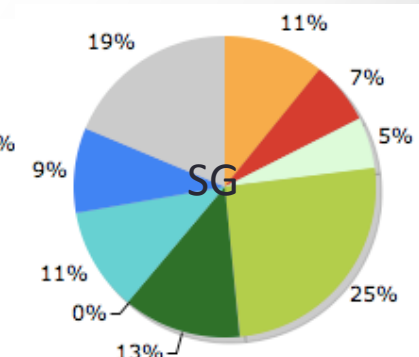
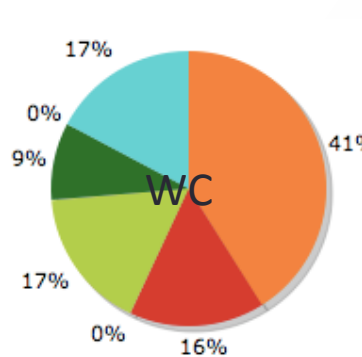
7A DLM 17 3/11/2008



**Lithium**  
**7B DLM 3 1/15/08**



**Titanium**  
**7B DLM 3 1/14/08**



Using RIOT

[sjsuriot.appspot.com/](https://sjsuriot.appspot.com/)



sjsuriot.appspot.com/



One account. All of Google.

Sign in with your Google Account



**Cassandra Paul**

cassandraannpaul@gmail.com

Password

Sign in

[Need help?](#)

[Sign in with a different account](#)

One Google Account for everything Google



Google accounts

**The application SJSU RIOT is requesting permission to access your Google Account.**

**Please select an account that you would like to use.**

☒ cassandraannpaul@gmail.com

Google is not affiliated with the contents of **SJSU RIOT** or its owners. If you sign in, Google will share your email address with **SJSU RIOT** but not your password or any other personal information.

Allow

No thanks

[Sign in to another account](#)

☐ Remember this approval for the next 30 days

# Welcome to SJSU Riot, cassandraannpaul

Sessions

New Session



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# Create New Session

**Observee** (required)

Who are you observing?

**Location**

What room and/or building is the observation taking place?

**Course**

What is the course/class number and/or name?

**Observation Description**


Use this space to write anything additional you want to remember about this observation before it begins.

**Template Key**

For developers only. Users should leave blank.

Create Session

## Your Sessions

Observee	Course	Date	Location	Description	
<a href="#">Andrew</a>	ASP	July 23, 2013, 6:25 p.m.	Here		 <a href="#">remove</a>
<a href="#">Cassandra</a>	physics 7a	May 20, 2014, 4:05 a.m.	PhysTEC		 <a href="#">remove</a>



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[License](#).

Based on a work at [sjsuriot.appspot.com](https://sjsuriot.appspot.com/)

## Small Group Time

## Whole Class Discussion Time

## Talking at Students

WC	Ind	G1	G2	G3	G4	G5	G6
WC	Ind	G1	G2	G3	G4	G5	G6

## Shared Student/TA dialogue

WC	Ind	G1	G2	G3	G4	G5	G6
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WC	Ind	G1	G2	G3	G4	G5	G6
IDEAS!							

## Observing Students

WC							
	G1	G2	G3	G4	G5	G6	

## Not Interacting with Students

Administrative/Grading

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Chatting

Out of Room

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## Your Comments:

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Explaining content

WC

WC

Listening to question

Closed dialogue

Open ended dialogue

WC Ind

WC Ind

WC Ind

Passive: scanning class

Active: listening to one group

Student Presentation

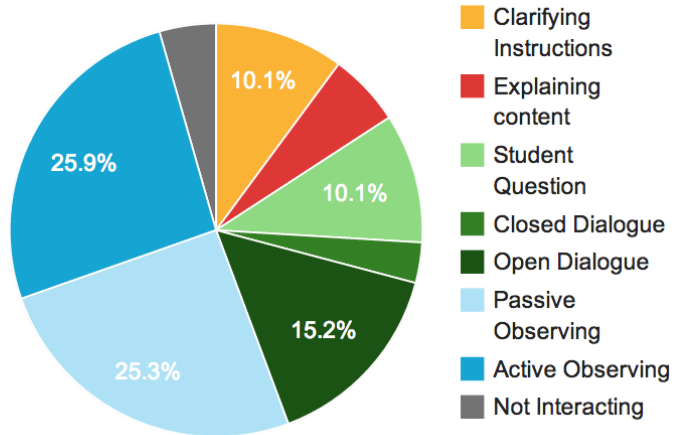
Students Talking Serially

Ind

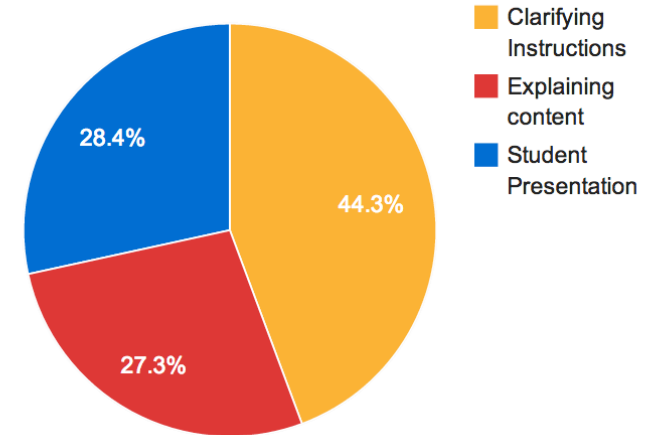
WC

# Session Charts

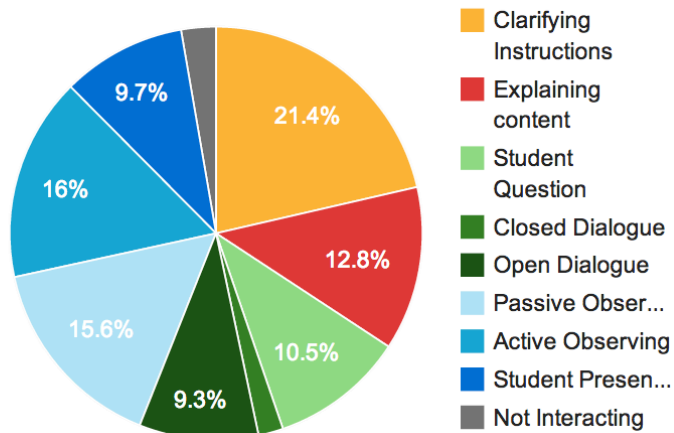
Small Group Time



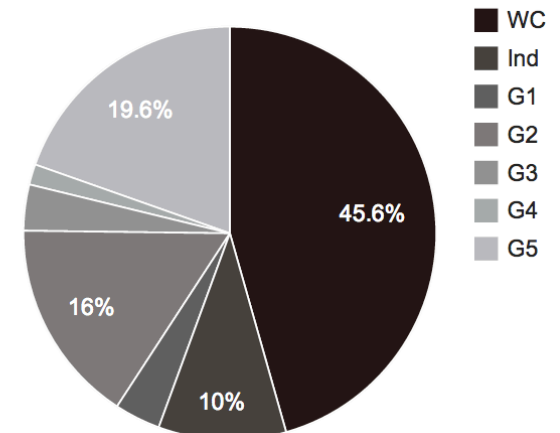
Whole Class Time

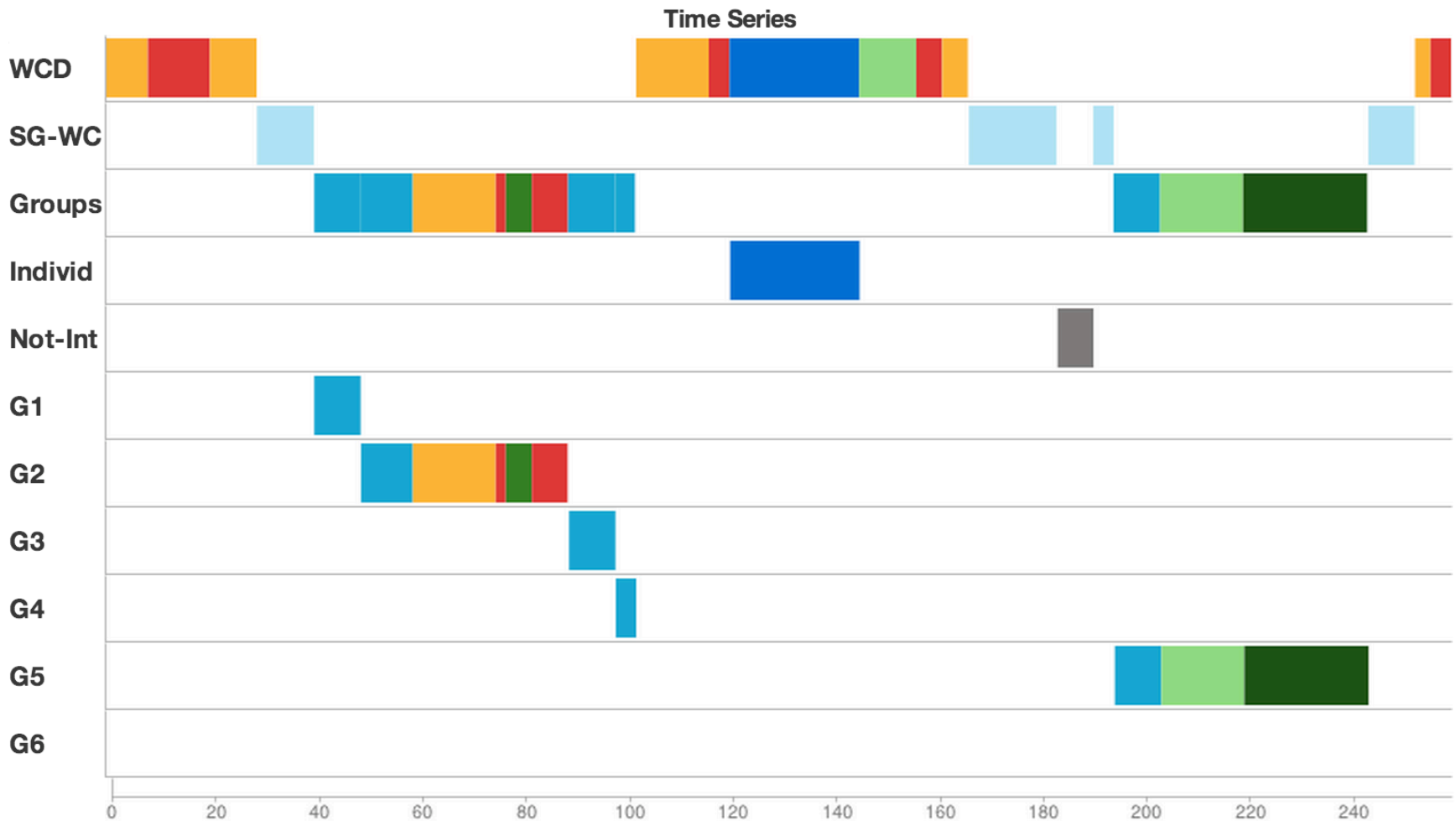


Overall (SG & WC)



Time Spent by Group





**Comment**

**Comment Time**

No Comments

N/A

Save as PDF

[sjsuriot.appspot.com/](https://sjsuriot.appspot.com/)

# Comparing RIOT data

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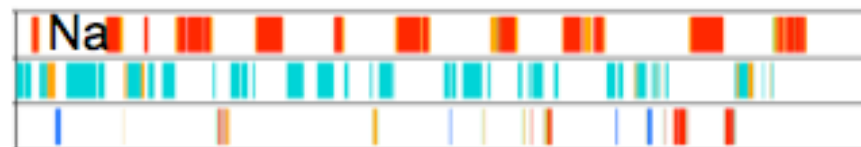
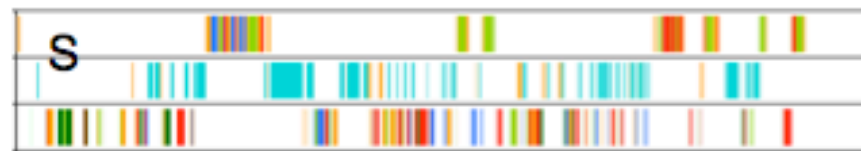
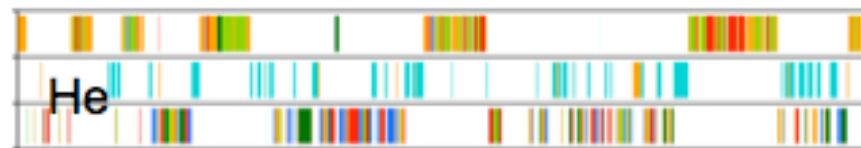
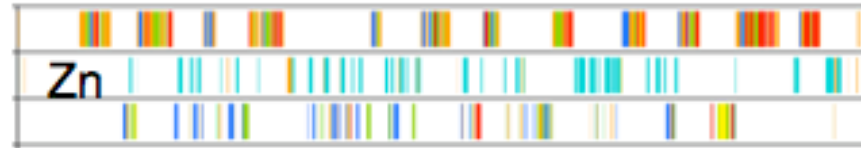
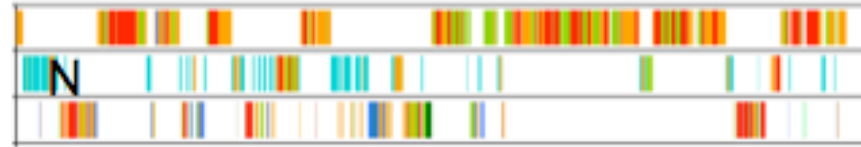
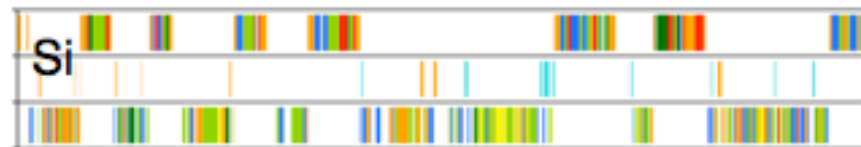
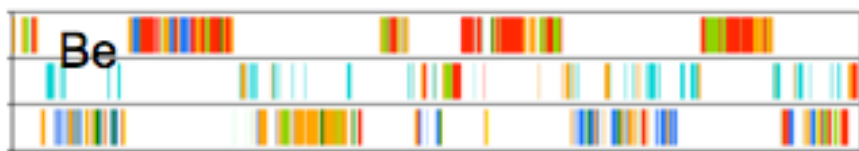
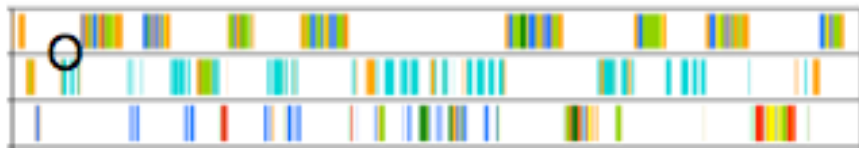
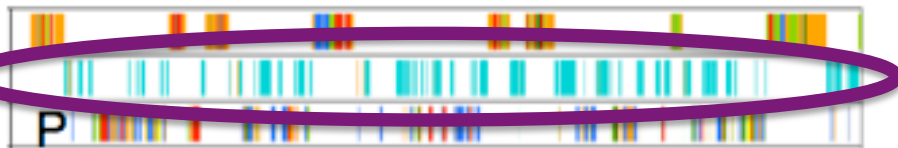
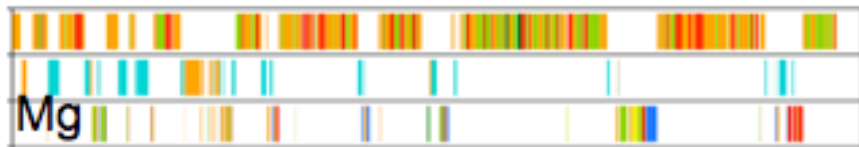
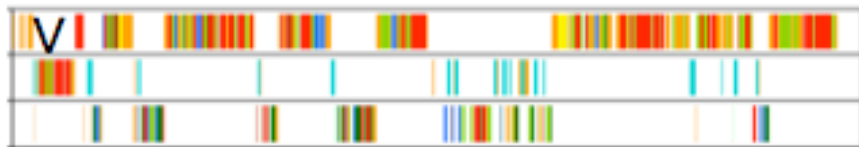
# Row Name Key

- WCD = Whole Class Discussion
- WC = Instructor is interacting with Whole Class
- SG = Instructor is interacting with Small Group
- SG-WC = When the instructor is interacting with the whole class during small group time
- Groups = The sum of all the groups rows to see all groups and individual interactions at once
- Individ/Ind = Instructor is interacting with an individual not in their group
- Non-Int= The instructor is not interacting with anyone
- G1= Instructor is interacting with group #1
- G2= Instructor is interacting with group #2
- ...

# In groups of 3 or 4

Compare the data from each of the RIOT outputs

- What does the data tell you about any individual classroom?
- What themes do you see across classrooms?
- Which do you think most resembles your own classroom?

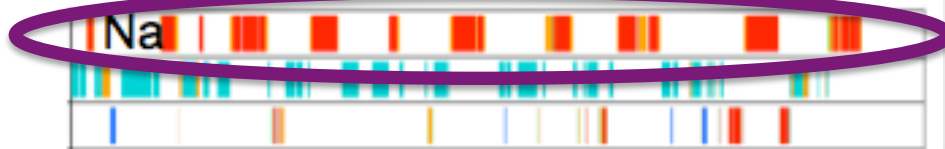
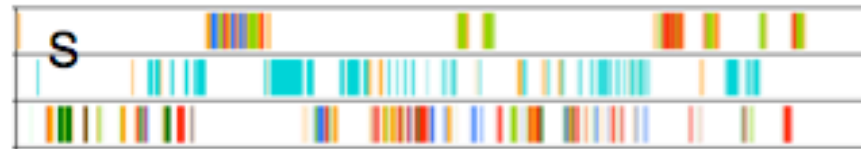
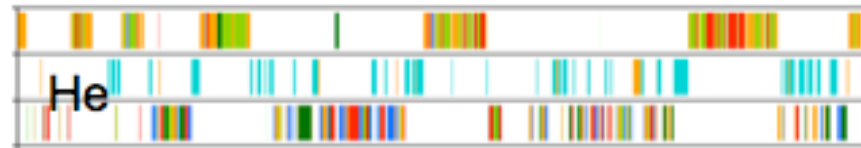
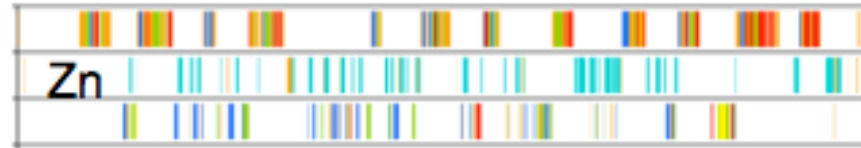
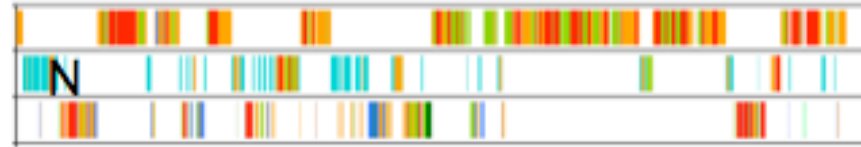
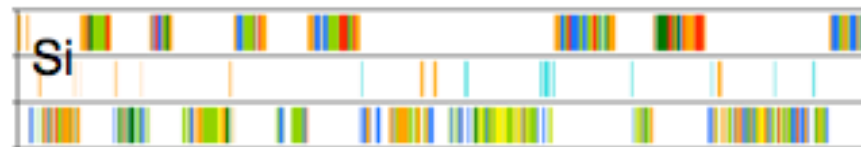
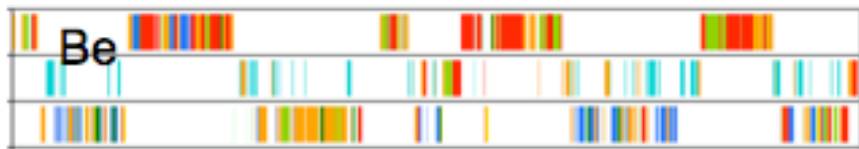
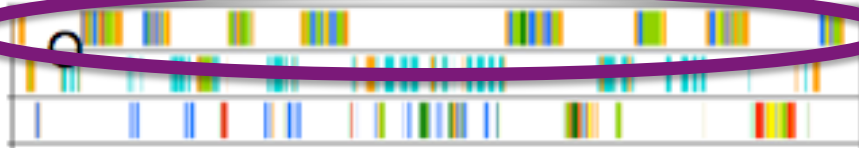
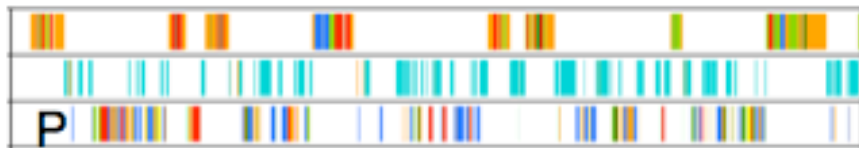
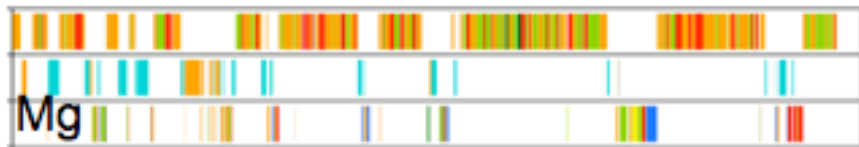
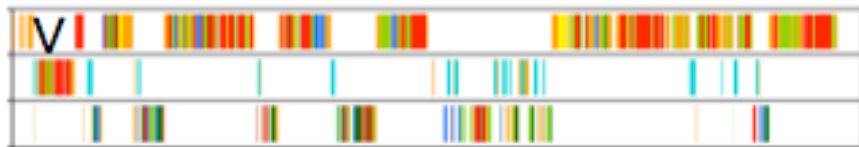


Talking At  
Students

Talking With  
Students

Observing  
Students

CLASP A Observation 1

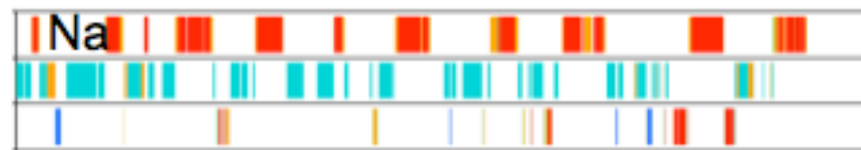
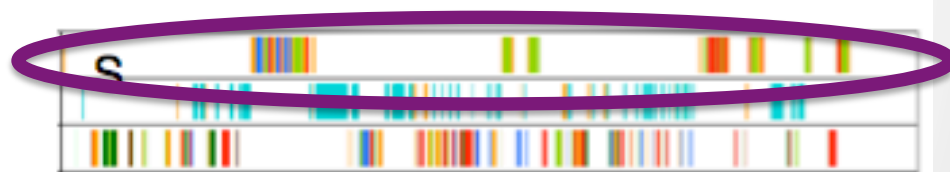
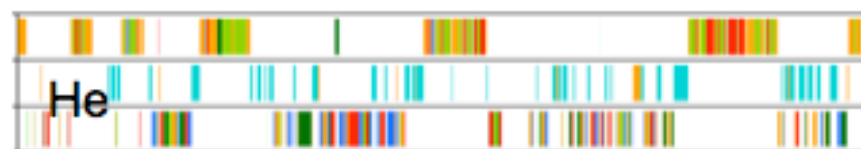
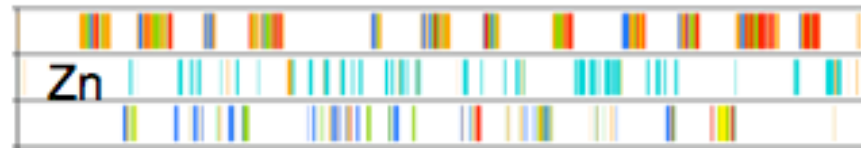
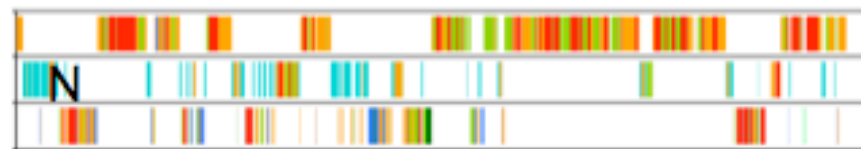
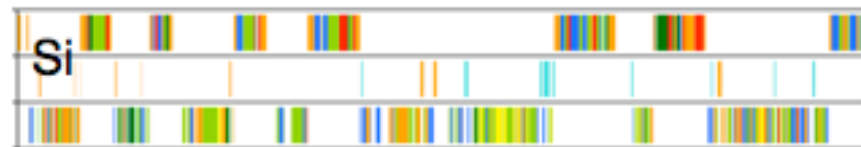
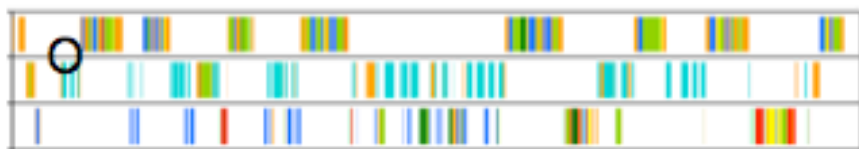
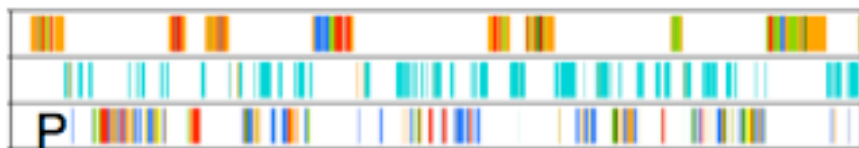
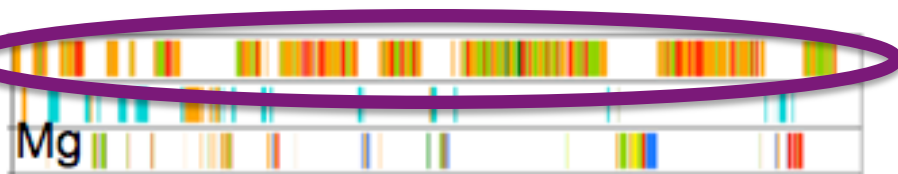
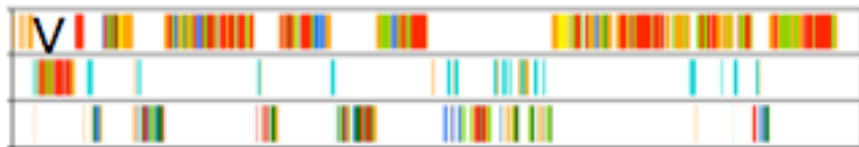


Talking At  
Students

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CLASP A Observation 1

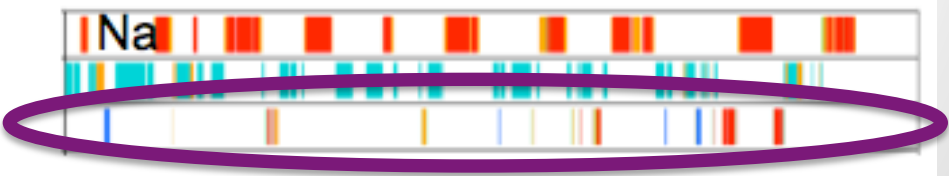
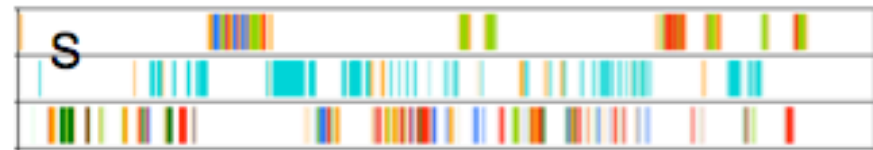
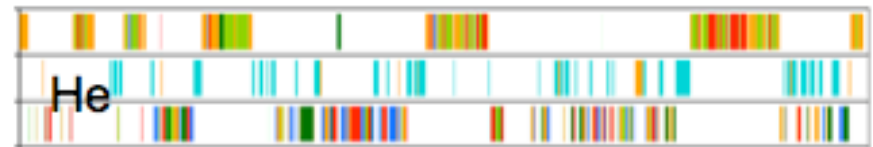
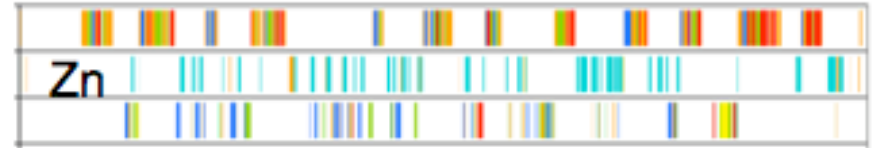
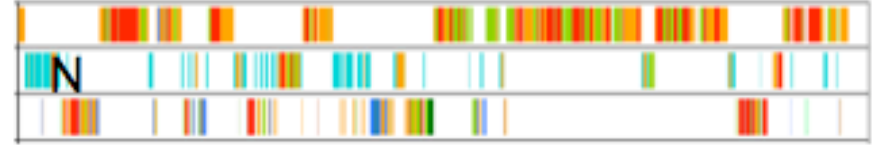
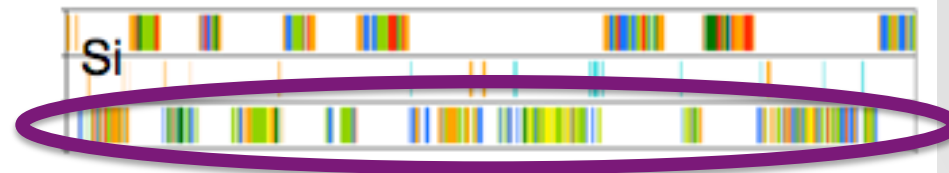
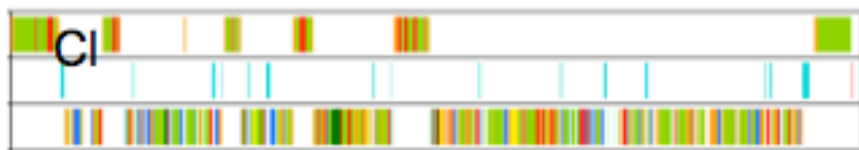
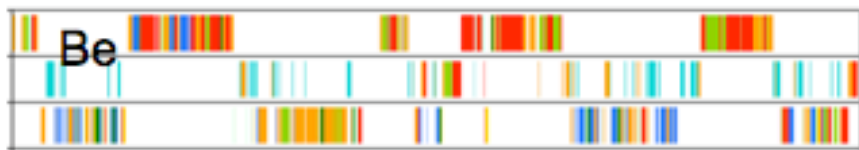
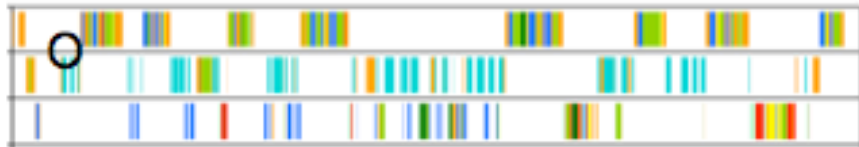
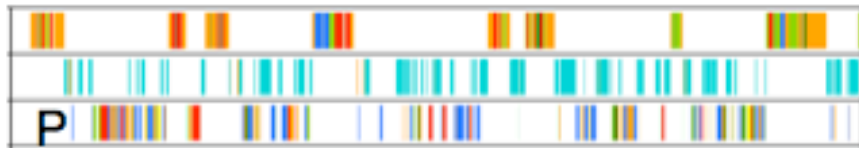
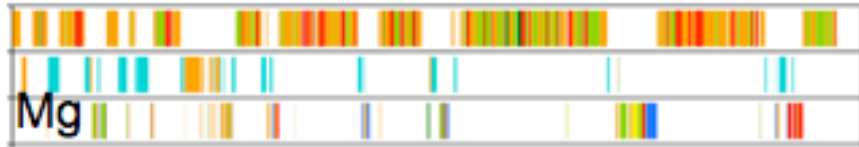
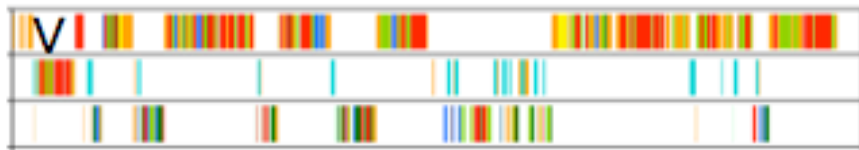


Talking At  
Students

Talking With  
Students

Observing  
Students

CLASP A Observation 1

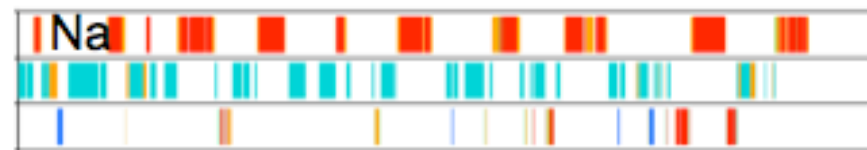
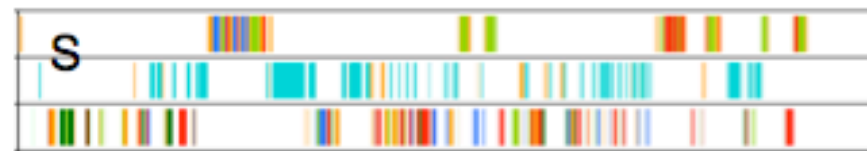
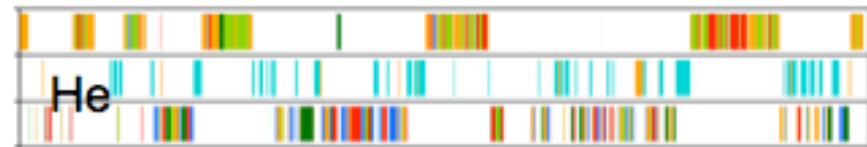
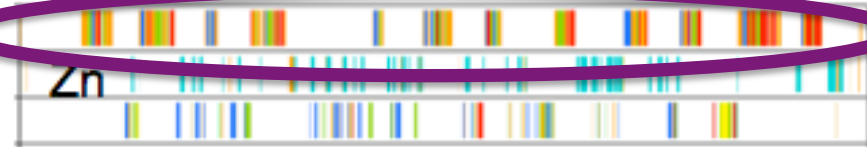
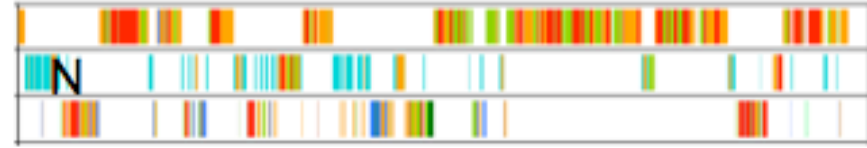
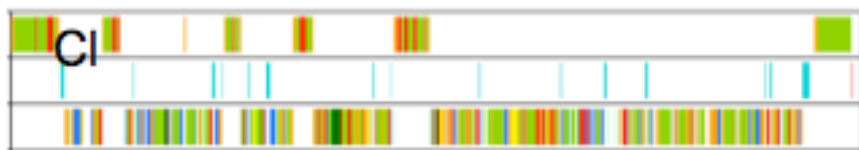
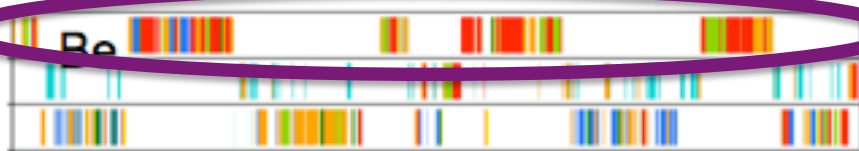
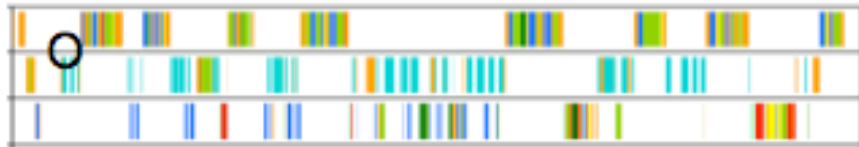
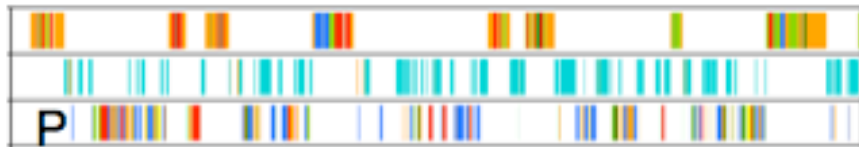
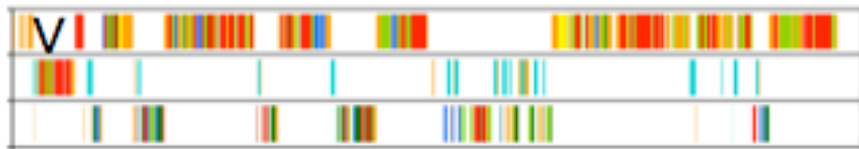


Talking At  
Students

Talking With  
Students

Observing  
Students

CLASP A Observation 1



Talking At  
Students

Talking With  
Students

Observing  
Students

CLASP A Observation 1

# On your own...

- Distribute the RIOT data so that every one at the table is looking at only one.
- Pretend that this is data from your own classroom
  - What would surprise you most?
  - What steps would you take based on this data?



# in a classroom with TAs/ LAs?

- Peer observations
- Have instructors reflect on the class session that was observe and make predictions:
  - What percent of time was spent...?
  - What do you believe are the most dominant colors on your RIOT output?
- Pair up with your observing partner and discuss your observations. Compare and contrast your observations (common experience).
- Go through similar activity

# in a classroom with TAs/ LAs?

- What activities might you do?
- What questions might you ask them?
- If you had them do multiple observations, what would you tell them to look for.

# BENEFITS OF RIOT

- (Relatively) Easy to use by novice observer
- Output gives an illustrative view of classroom (a lot is learned about the classroom in seconds, our eyes respond to patterns)
- Not as invasive/distracting as video tape (instructors more likely to allow it, everyone more likely to act naturally in front of it)
- Students not video taped (IRB exempt)
- Can be modified to measure MANY things
- Instantly turns qualitative data into quantitative data for statistical analysis

# WEAKNESSES OF RIOT

- Not a replacement for video
  - Coarse observation
  - Info on quality lost (in current form)
  - Only gives you info regarding what TA is doing (in it's current form)
- You can't go back and re-analyze interactions
  - (Next step to see if Active Observing is a true indicator for student achievement is to see what happens before and after active observing)

# (SPOT)

## (coming soon!)

**Class mode**

Whole groupIndividualSmall group/ pairs

**Session log****Add note**

submit

**Teacher actions**

Teacher

**Student actions**

Shout out

Choral response


# Thank you!



**San José State**  
UNIVERSITY

Thank you to Emily Ashbaugh West & Wendell Potter, additional co-developers of RIOT

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Slides and more info at: [www.sjsu.edu/people/cassandra.paul/RIOT/](http://www.sjsu.edu/people/cassandra.paul/RIOT/)

RIOT: [sjsuriot.appspot.com/](http://sjsuriot.appspot.com/)



# Learning Assistant Resource Videos

## University of Colorado



# Students Say:

- “Make a yellow and red sandwich, if you are going to explain make sure you talk with them about their ideas before and after.”
- “I realized that I was spending a lot more time leading the discussion in front of the room than I thought.

# Physics 7a → CLASP

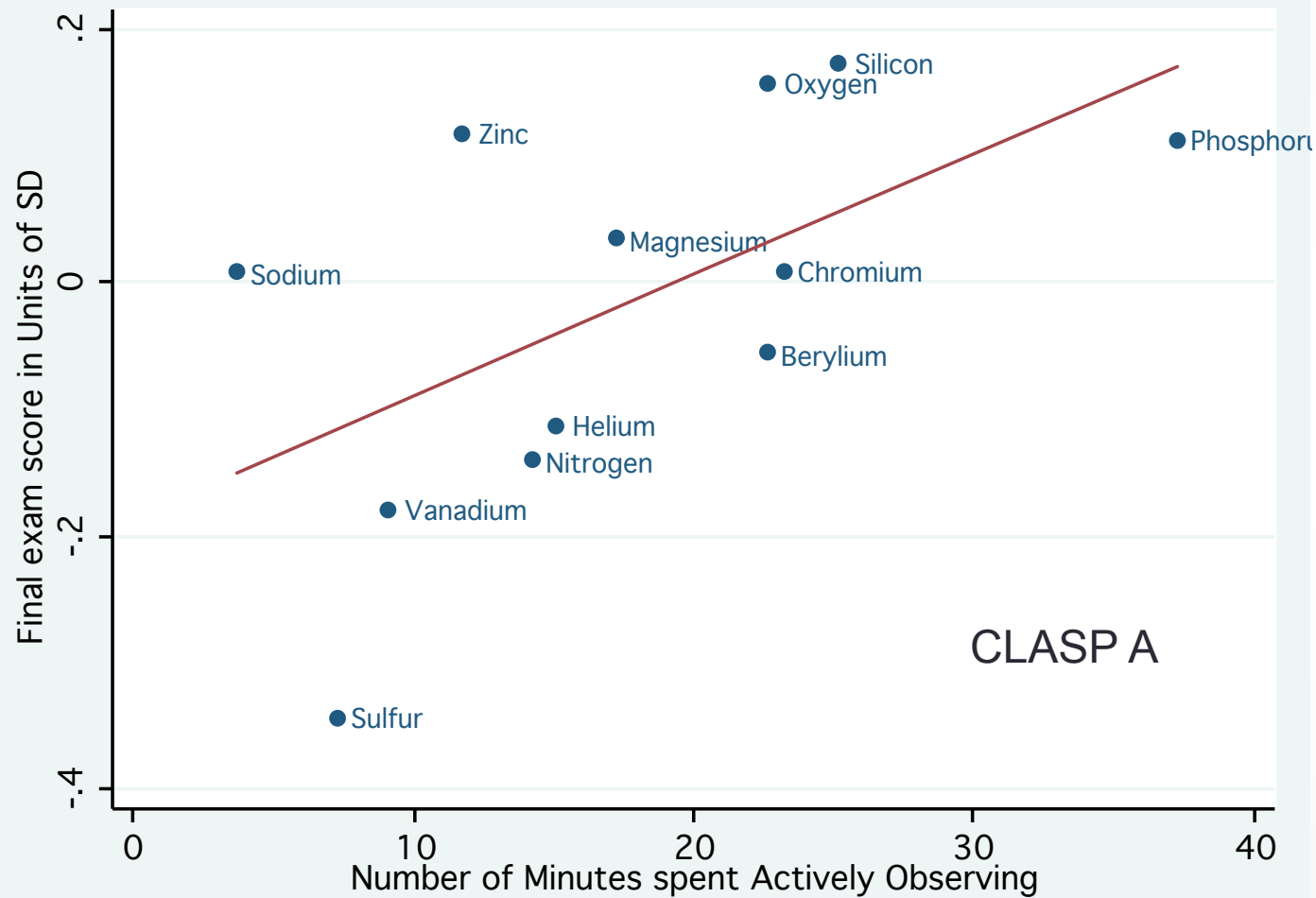
## Traditional Intro Physics Courses

Lecture	Lab
50	20
50	20
50	20
50	20
50	20
50	20
50	20
50	20
50	20
50	20

## CLASP

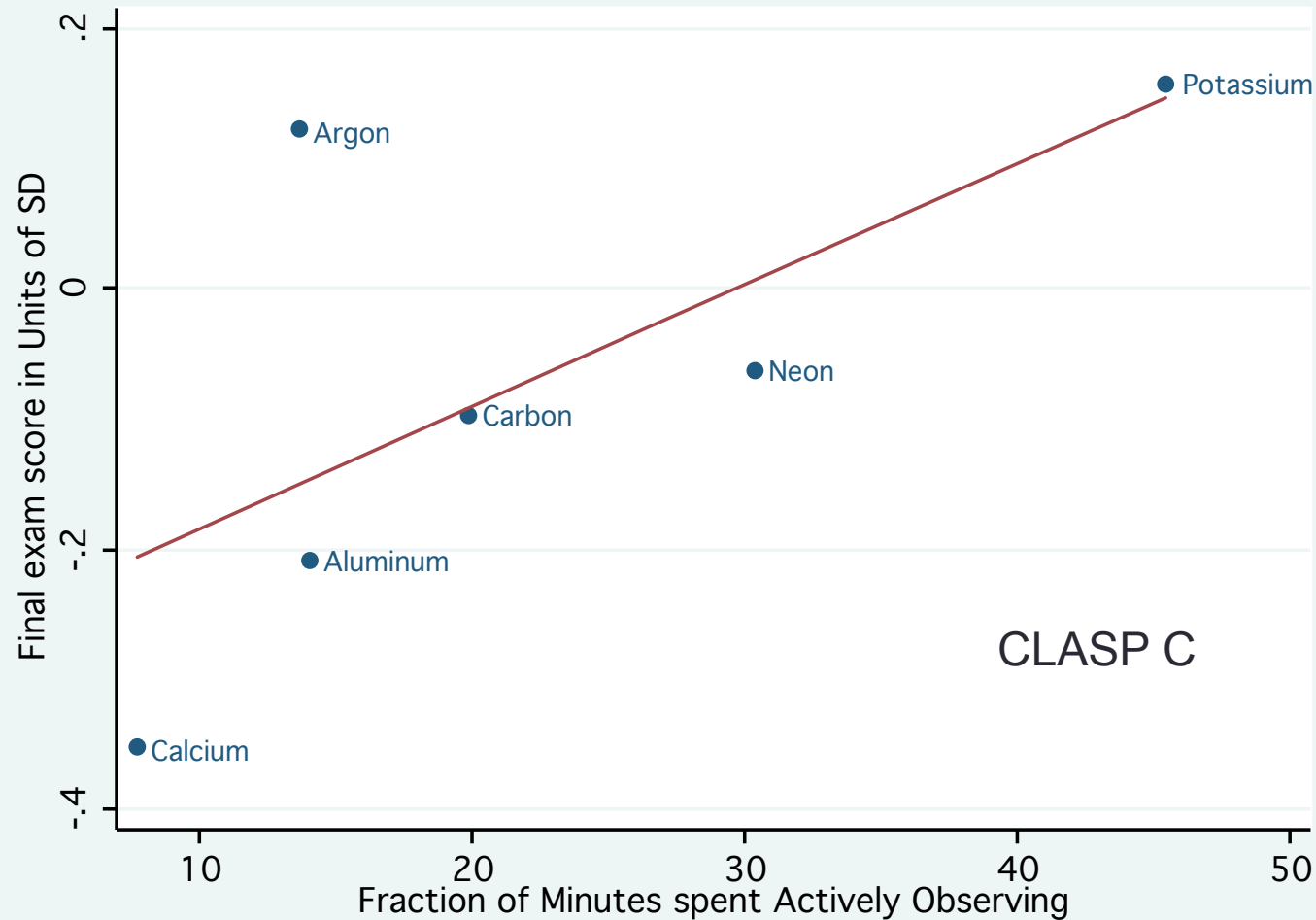
Lecture	Discussion	Lab
150	30	
	30	
	30	
	30	
	30	
150	30	
	30	
	30	
	30	
	30	

# ACTIVE OBSERVING IS CORRELATED WITH STUDENT ACHIEVEMENT



A 10 minute increase in active observing correlates to .1(SD) increase in mean final exam score. ( $R^2=.33$ ,  $p=.05$ )

# ACTIVE OBSERVING IS CORRELATED WITH STUDENT ACHIEVEMENT



A 10 minute increase in active observing correlates to .09(SD) increase in mean final exam score. ( $R^2=.44$ , NOT SIGNIFICANT)