The Real-time Instructor Observing Tool for Future Teachers

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Available at: https://works.bepress.com/cassandra-paul/25/
The Real-time Instructor Observing Tool (RIOT) for future teachers

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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
  o Motivation
  o Desired components

• RIOT Constructs
  o Categories of Interactions
  o Screen layout
  o Interpreting output

• Using RIOT
  o Try it out!

• Small group activities
  o Comparing RIOT data
  o Creating RIOT classroom activities
Real-time Instructor Observing Tool

History and Development
CLASP

COLLABORATIVE LEARNING THROUGH ACTIVE SENSE-MAKING IN PHYSICS

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

Po1ter et al. *Sixteen years of Collaborative Learning through Active Sense-Making in Physics* 2013
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)
  o Categories are broad for easy observer coding and observee interpretation
  o RIOT does not require judgment on the part of the observer

• RIOT provides a visual representation of classroom observation data

• RIOT is free!
  o Originally developed with expensive FileMakerPro software
  o Andrew Reid at San José State University developed web-based open source version of RIOT

RIOT Constructs
RIOT Categories

Talking At Students

- Clarifying Instructions
- Explaining Physics
- Listening to Question

Talking With Students

- Closed Dialogue w/students
- Open Dialogue w/ students
- Open Dialogue with Ideas
- Passively Observing Students
- Actively Observing Students

Observing Students

- Checking Homework
- Fixing Apparatus
- Out of Room
- Not Interacting/Reading
- Chatting with Students

Not Interacting With Students
### Small Group Time

**Talking at Students**
- WC
- Ind
- G1
- G2
- G3
- G4
- G5
- G6

**Shared Student/TA dialogue**
- WC
- Ind
- G1
- G2
- G3
- G4
- G5
- G6

**Observing Students**
- WC
- G1
- G2
- G3
- G4
- G5
- G6

### Whole Class Discussion Time

**Clarifying instructions**
- WC

**Explaining content**
- WC

**Listening to question**
- WC

**Closed dialogue**
- WC

**Open ended dialogue**
- WC

**Passive: scanning class**
- WC

**Active: listening to one group**
- Ind

**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
### Small Group Time

#### Talking at Students

- **Clarifying instructions**
- **Explaining content**

#### Shared Student/TA dialogue

- **Listening to question**
- **Closed dialogue**
- **Open ended dialogue**

#### Observing Students

- **Passive: scanning class**
- **Active: listening to one group**
  - **Student Presentation**
  - **Students Talking Serially**

#### Not Interacting with Students

- **Administrative/Grading**
- **Working on Apparatus/Material**
- **Chatting**
- **Out of Room**
- **Class Prep/Reading TA Notes**

### Whole Class Discussion Time

#### Your Comments:

![Your Comments:]

Submit Comment
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

Time in minutes ➔

Color codes:
- Orange: Clarifying Instructions
- Red: Explaining Physics
- Light Green: Listening to Question
- Green: Closed Dialogue w/students
- Green: Open Dialogue w/ students
- Yellow: Open Dialogue with Ideas
- Light Blue: Passively Observing Students
- Blue: Actively Observing Students
- Dark Green: Checking Homework
- Black: Fixing Apparatus
- Grey: Out of Room
- Grey: Not Interacting/Reading
- Light Grey: Chatting with Students
Using RIOT

sjsuriot.appspot.com/
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.

Sign in to another account

Remember this approval for the next 30 days
Welcome to SJSU Riot, cassandraannpaul
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

<table>
<thead>
<tr>
<th>Observee</th>
<th>Course</th>
<th>Date</th>
<th>Location</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Andrew</td>
<td>ASP</td>
<td>July 23, 2013, 6:25 p.m.</td>
<td>Here</td>
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<tr>
<td>Cassandra</td>
<td>physics 7a</td>
<td>May 20, 2014, 4:05 a.m.</td>
<td>PhysTEC</td>
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Comparing RIOT data
**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

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
  o What would surprise you most?
  o What steps would you take based on this data?
How might you use this in a classroom with TAs/LAs?

• Peer observations
• Have instructors reflect on the class session that was observe and make predictions:
  o What percent of time was spent...?
  o 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
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
  o Coarse observation
  o Info on quality lost (in current form)
  o 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)
Student Participation Observing Tool (SPOT)
(coming soon!)

sjsuspot.appspot.com/
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/

RIOT: sjsuriot.appspot.com/
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

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
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<tbody>
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<td>50</td>
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CLASP

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Discussion</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>30</td>
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ACTIVE OBSERVING IS CORRELATED WITH STUDENT ACHIEVEMENT

A 10 minute increase in active observing correlates to .1(SD) increase in mean final exam score. (Rsqrd=.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. (Rsqrd=.44, NOT SIGNIFICANT)