OPTIC
POGIL®

Observation Protocol for Teaching in Interactive Classrooms

Revised June 2021

Abstract

OPTIC is an observation tool for: 1) the coaching and mentoring of learner-centered practitioners who use collaborative small groups, 2) experienced practitioners to obtain data on their facilitation, 3) administrators to aid in the evaluation of faculty who participate in learner-centered collaborative teaching styles, and 4) the documentation of collaborative small-group learning in a learner-centered classroom.

OPTIC Coding Manual

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Overview:

OPTIC is an observation tool for: 1) the coaching and mentoring of learner-centered practitioners who use collaborative small groups, 2) experienced practitioners to obtain data on their facilitation, 3) administrators to aid in the evaluation of faculty who participate in learner-centered collaborative teaching styles, and 4) the documentation of collaborative small-group learning in a learner-centered classroom. OPTIC does not provide enough useful information for socratic lectures; there are other tools for this type of classroom.

NOTE: OPTIC is a whole classroom observation instrument; OPTIC is not an observation tool for individual learning teams. This tool is for observing a single instructor at a time. With regard to Teaching/Learning Assistants, please see Other Parts of the Tool at the end of the manual.

In OPTIC, both the instructor and student behaviors are marked in two-minute intervals. Multiple actions may be coded within the same 2-minute interval. For example, one section of OPTIC focuses on the amount and type of interaction students have with each other and with the instructor; such as "instructor talking to learning team," "students interacting with each other within a learning team," or "learning teams interacting with other learning teams."

An OPTIC app is available for data collection and data visualization. If the OPTIC app is used, a visual in the form of a chronological timeline displaying all the codes marked during the observation in the interval in which they occurred is produced. Alternatively, a visualization can be produced manually. This timeline is a "big-picture" view of the type and position of activities or events that are occurring in the classroom. This visual timeline gives the instructor a snapshot view of the entire class session and is an intuitive way of reflecting on one's teaching. Behaviors and interactions are observed but no judgements are made.

Please note that the use of any of these codes does not presuppose a "good" or "bad" action by the facilitator or instructor; the instrument is simply recording what is happening in the classroom. The instructor, mentor, or administrator needs to interpret the effectiveness of instruction.

There are three main categories of codes: *Interactions in the Classroom, Facilitator Actions, and Activity Type.* All three categories may be coded simultaneously. Notice that coding of *Interactions in the Classroom* may also result in coding of *Facilitator Actions*. For example, coding the Interaction **I → WC** will lead to coding *Facilitator Actions* such as **LEC, CM, or PLA**. The category *Interactions in the Classroom* is the observed action of the instructor, and the category *Facilitator Actions* is the interpretation of that observed action. The codes in *Interactions in the Classroom* denote the presence of an observed action within a 2-minute interval. However, the code **%S** in *Interactions in the Classroom* reflects the portion of students participating or paying attention in the classroom and is coded at the end of every 2-minute interval.

Interactions in the Classroom:

It is possible that the interactions in the classroom are uneven. This whole class coding exercise should reflect the general activity of the whole class, students and/or learning teams within each two-minute time frame. However, we encourage you to note in the comments any unevenness for future discussion with the instructor. For instance, during the two minutes, one team is working individually on an activity, but the rest of the teams are actively exchanging in dialogue. The code of S↔S would be checked because you observed it generally across the whole class but the lack of S ↔ S by one learning team would be noted in the comments. Additionally, if the instructor gives a break in the class, do not code any Interactions in the Classroom, but do code CM in Facilitator Actions throughout the break.

I→WC (**I**nstructor communicating to **W**hole **C**lass)
   -Instructor verbally communicating to the whole classroom of students. The students are not verbally responding back to the instructor.

Example 1:	Instructor*: Read through the information in the Model silently before discussing with your group. You'll have about ten minutes to get through Key Questions 1-4 before we report out.*
Example 2:	Instructor: *Think about what we've just learned on Lewis structures. We're going to extend this idea to think about the three-dimensional structure of molecules now.*
Example 3:	Instructor: *All right teams, remember that next Monday is your first exam. Be sure to think about study strategies you are going to implement.*
Example 4:	Instructor: *"Please do not use the sinks as garbage cans; please put your waste in the real garbage can in the back of the room."*

I↔WC (**I**nstructor interacting with **W**hole **C**lass)
   -Instructor interacting with the whole classroom of students including learning team call outs. The student(s) *are* verbally responding. Non-verbal responses (e.g. raising hands) are not coded.

Example 1:	Instructor: *Someone, tell me what your team decided for Question 12.* Fernandez: *We said 12 kilograms.* Instructor: *And Allie, I noticed that your team got a different answer. Why is that?* Allie: *Well, we thought we needed to multiply by three since that was the coefficient for sodium, but I guess that was already accounted for by using the stoichiometric ratio earlier in the problem.*

IxWC (**I**nstructor **not** observing or **not** monitoring any portion of the **W**hole **C**lass)
-Instructor *is not* observing or not monitoring any portion of the whole class. This may include interacting with a single student away from their learning team, outside of whole-class discussion.

Example 1:	Instructor is writing instructions on the board that the groups will be using to report out and therefore is not interacting with the classroom.
Example 2:	The instructor is taking attendance.
Example 3:	A student comes up and tells the instructor that they are leaving for their vacation on the same day as the final exam.
Example 4:	Getting classroom and/or laboratory materials ready to use. For instance, erasing a chalkboard.

I→LT (**I**nstructor communicating to **L**earning **T**eam)
-Instructor is communicating to learning team, but the learning team *does not* communicate back to the instructor. The instructor interaction could include a non-verbal interaction with the learning team such as the instructor pointing to something on learning team's activity sheet.

Example 1:	Instructor to Learning Team - *Something is wrong with your answer to Exercise A. I'll let you figure it out.*

Example 2:	Instructor *gives an affirmative "thumbs-up" to the Learning Team and then moves on to another Learning Team.*
Example 3:	Instructor to Learning Team - *Great cooperation! I like the way your team is building a consensus before moving to the next model.*

IoLT (**I**nstructor **o**bserving **L**earning **T**eam, no interaction)

> -The instructor is observing/monitoring learning team work without interacting with learning team. The instructor *is not* verbally or non-verbally communicating with a learning team(s).

Example 1:	Instructor sees learning team struggling but chooses not to intervene, instead letting them arrive at their own conclusion.
Example 2:	Xianyu: *I calculated 8.625 mg.* Gail: *That sounds too small…* Peyton: *Oh, look, you should have multiplied instead of dividing by 2!* Instructor watches the Learning Team but does not interact with the Learning Team throughout exchange, and then moves on.
Example 3:	Instructor is moving around the room and glancing at student work but not interacting with teams.

I↔LT (**I**nstructor interacting with **L**earning **T**eam)

> -Instructor is interacting with a learning team, the learning team *does* communicate back to the instructor. (Note: not coded during whole class discussion). The instructor interaction could include a non-verbal interaction with the learning team such as the instructor pointing to something on learning team's activity sheet; however, there should be a confirmation response of some type from the learning team for communication back to the instructor (verbal or non-verbal). Hence a two-way communication is essential for this code.

Example 1:	Xianyu: *I calculated 8.625 mg.*

	Instructor: *That sounds too small compared to your starting mass… Do you see any problems?*
	Peyton: *Oh, look, you should have multiplied instead of dividing by 2! Is that right, Dr. Radford?*
	Instructor: *Put the correct units on the value and then you'll be good!*
Example 2:	Instructor approaches a team and points to a direction on the page of the activity
	Josh: Oh, I didn't see that. I get what we need to do now.

LT↔LT (Learning **T**eam interacting with **L**earning **T**eam(s))
-Learning teams or learning team representatives interacting or communicating information (written, oral or digital) to other learning team or teams.

Example 1:	Instructor set-up (speaking to only two learning teams): *Since you're done early, I want your two teams to each make up a stoichiometry problem for each other and then trade off.*
	Rochelle to other team representative: *Here's our problem. Should we compare answers after?*
Example 2:	Instructor set-up (speaking to whole class): *Remember when you get to Q6 that you will need to compare data with another team.*
	Learning Team 1 Member: *Okay, our data is collected. It looks like Team 4 is done, let's talk with them.*
	Learning Team 4 Member: *Team 1, our data looks similar to yours except for the 10-gram-mass data point. Should we both retest this one?*
	Learning Team 1 Member: *Yeah, good idea. Let's each retest and then compare again.*
Example 3	Students write answers on the board. Each learning team then goes to board and leaves post-it notes with feedback. The learning teams rotate back to their original work to discuss and respond to the post-it note feedback.

S↔S (**S**tudents interacting with **S**tudents within learning team)

-Students interacting with each other within the same learning team during collaborative activity.

-Interactions should pertain to learning activity

Example 1:	Xianyu: *I calculated 8.625 mg.* Gail: *That sounds too small…* Peyton: *Oh, look, you should have multiplied instead of dividing by 2!* *(Xianyu, Gail and Peyton are in the same learning team)*

%S (**P**ercent **S**tudents participating)

-An estimated percent of students participating or paying attention. This should be coded at the end of each 2-minute time interval (last 10s). The action for this code involves a short scan (no more than 5 seconds) of the classroom to estimate the percentage of students participating or paying attention to classroom/activity related materials. Do not count individual students. Code with 0,1,2,3.

Code	% of students participating or paying attention
0	0
1	Less Than 20
2	Between 20 and 80
3	Greater Than 80

Facilitator Actions:

Note: It is possible for no facilitator actions (e.g., instructor reading notes)

PLA (**P**reparing for **L**earning **A**ctivity)

-Content or methodology in preparation for a learning-activity component, including verbal instructions for learning teams and writing content on the board for the whole class. This includes explaining methodology, like the description of

student roles and/or of reporting out events for the future. This does not include time management cues which are CM. When an instructor uses and/or distributes note sheets or slides for a lecture, do not code as PLA.

Example 1:	Instructor*: Please read through the information in the Model silently before discussing with your learning team. You'll have about ten minutes to get through Key Questions 1-4 before we report out.*
Example 2:	Instructor*: The manager for today is the person whose birthday is closest to today. The manager will assign the roles of spokesperson, technician and recorder to the rest of the team.*
Example 3:	Instructor: *I want the learning teams to focus on the process skill of teamwork; I will be watching if you are working cohesively and will coach accordingly.*
Example 4:	Instructor: *Model number two starts on page 37; the activity builds on Model one from yesterday's class session. Make sure you reference it.*
Example 5:	Instructor gave directions to write specific team answers on the board as the team completed the items.

MWC (**M**oving through **W**hole **C**lassroom)
-Instructor moving about the whole classroom actively observing, monitoring or coaching the learning teams.

Example 1:	As teams work, the instructor moves from learning team to learning team observing the teams, but not conferring with a specific team.
Example 2:	As teams work, the instructor moves from learning team to learning team, asking guiding questions to the teams as needed.

SWC (Static while observing **W**hole **C**lassroom)

> -Instructor actively observing or monitoring the whole classroom while remaining in one place. Instructor is static, not moving while observing. This action should be observed for at least 30 seconds.

Example 1:	Instructor is standing at the back of the room but is still observing the classroom from a stationary position for more than 30 s.
Counter Example 1:	The instructor is at the front of the room taking attendance or organizing materials. This is an example of classroom management (CM).

INTV (Intervention)

> -Instructor intervenes and addresses the entire class to respond to student needs such as a misconception or confusing concept during an activity. The instructor might stop the learning teams and regroup the entire class to respond to student needs such as addressing (they may also use a whole class announcement): a potential misconception or confusing concept, process skills, or a correction to the activity documents.

Example 1:	Instructor: *I've had several questions about Q5. Let's review the Bohr Model before we move on.*
Example 2:	Instructor: *All right everyone, please find Q4. There is a typo in the second sentence. It should say isotope, not isomer.* (This may occur as a general announcement to whole class while students are actively working.)
Example 3:	Instructor: *I see that several learning teams are not functioning effectively because team members are working individually instead of collaboratively. Managers, please make sure that you are helping your team work more cohesively and focus on today's process skill of teamwork.*

RO (**R**eporting **O**ut)

-Within the learning activity, information is being shared by all students or learning teams demonstrating and/or explaining their constructed knowledge. The code begins when this demonstration of knowledge actually occurs, not when the instructor or activity says the RO will occur. The students might be using white boards, clickers, hand signals, or verbal responses to demonstrate and transmit their learning to the instructor and other learning teams. Reporting out can happen at any point during the activity to assist the instructor in determining whether learning or process objectives are being met.

Example 1:	Spokesperson (answering question from instructor): *the answer was up because it was a larger number.*
Example 2:	Learning team representative writes answers on the board for other learning teams to view. No discussion of those answers is necessary, just disseminating information with the opportunity of other learning teams to view and read.
Example 3:	With all learning teams participating, a spokesperson from one learning moves to another learning team to share responses, as suggested by activity directions.
Example 4:	The Reporter placed their completed white boards at the front in a pile, as directed previously by the instructor, and they were ready to present. After five minutes passed, the instructor started a whole class discussion about the white board responses. The coding of RO would not start until the discussion of the white board responses started.
Example 5:	Instructor: *Here is a clicker question for you to answer individually based on what we just discussed. Students clicked in answers.*

LEC/DISC (**Lec**turing/**Disc**ussion)

-The instructor is lecturing to the whole class, including follow up discussion. Note: It is possible to have both RO and LEC/DISC. Report out is the action of students demonstrating and/or explaining their constructed knowledge. If connected to RO, discussion is expanding/explaining past or future content/material.

CM (**C**lassroom **M**anagement)

-Instructor is involved in or discussing classroom management / administration tasks, such as erasing the board and setting up the AV. Not related to the content or methodology of the learning activity. Includes instructor's management of time or pacing. Description of roles is not CM; it is PLA because it is related to methodology. CM can also include stationary tasks such as taking attendance, setting up a multimedia device for use during class, or erasing the board/putting out markers. Additionally, if the instructor gives a break in the class, do not code any Interactions in the Classroom, but do code CM in Facilitator Actions.

Example 1:	The instructor is at the front of the room taking attendance or organizing materials, prepping clicker questions, writing on the whiteboard, erasing whiteboard, putting out markers, etc.
Example 2:	Instructor: *All right teams, remember that next Monday is your first exam. What study strategies are you implementing?*
Example 3:	Instructor: *Please do not use the sinks as garbage cans. Please put your waste in the real garbage can in the back of the room?*
Example 4:	Instructor: *Managers, by a show of fingers, how many more minutes does your team need?*

Activity Type:

Note: If instructors are giving mini- or full- lectures, no activity type will be coded.

POGIL (**P**rocess **O**riented **G**uided **I**nquiry **L**earning)

-Instructor is using a POGIL approach. For more information, see pogil.org.

CLA (**C**ollaborative **L**earning **A**pproach)

-Instructor is using student-student collaborative learning approach other than POGIL. For example, in-class small group, think-pair-share approach, paired or group problem solving, in-class peer-led instruction, problem/project-based learning, etc. Determine during pre-observation discussion if the instructor would like to have these collaborative learning approaches coded together or separately.

IND (**Ind**ividual)

-Instructor presents a task for students to work on individually. For example, problem solving, reflection, one-minute papers, individual clicker questions, bell ringer/warm up, exit ticket, etc.

Other Parts of the Tool

Are Roles Being Used (Yes or No)

- The instructor has assigned roles to students in Learning Teams with specific responsibilities for the development of content and process skill objectives.

Number of Students

- Number of students in the classroom during the observation.

T.A. Actions

- This tool is designed to observe one instructor interaction throughout a classroom experience. For a class with Teaching/Learning Assistants, consider having a separate observer/coder for each Teaching/Learning Assistant. It may also be possible to consider the whole group of Teaching/Learning Assistants as a single instructional facilitator. General notes about Teaching/Learning Assistant actions should be documented in this section.

Comments

- Space for additional comments.

Supplemental Documents

OPTIC Code Information Sheet

- A succinct list of codes. This form will be available online using POGIL webpage link on cover page.

OPTIC (Observation Protocol for Teaching in Interactive Classrooms) Codes	
Codes (KEY below)	**Shorthand meaning**
Interactions in the classroom	
I→WC	Instructor verbally communicating to the whole classroom of students. The students are not verbally responding back to the instructor.
I↔WC	Instructor interacting with the whole classroom of students including learning team call outs. The student(s) *are* verbally responding. Non-verbal responses are not coded.
IxWC	Instructor *is not* observing or not monitoring any portion of the whole class.
I→LT	Instructor is communicating to learning team, but the learning team *does not* communicate back to the instructor.
IoLT	The instructor is observing/monitoring learning team work without interacting with learning team
I↔LT	Instructor is interacting with a learning team, the learning team *does* communicate back to the instructor. (Note: not coded during whole class discussion)
LT↔LT	Learning teams or learning team representatives interacting or communicating information (written, oral, or digital) to other learning team or teams.
S↔S (within LT)	Students interacting with each other within the same learning team during collaborative activity.
%S	An estimated percent of students participating or paying attention. Code with 0 (0%),1 (less than 20%), 2 (20-80%), 3 (greater than 80%)
Facilitator Actions	Note: It is possible for no facilitator actions (e.g., instructor reading notes)
PLA	Content or methodology in preparation for a learning-activity component, including verbal instructions for learning teams and writing content on the board for the whole class.
MWC	Instructor moving about the whole classroom actively observing, monitoring or coaching the learning teams.
SWC	Instructor actively observing or monitoring the whole classroom while remaining in one place. Instructor is static, not moving while observing. Observe at least 30 s.

INTV	Instructor intervenes and addresses the whole class to respond to student needs such as a misconception or confusing concept during an activity.
RO	Within the learning activity the code begins when the information is being shared by all students or learning teams demonstrating their constructed knowledge (e.g., clickers, whiteboards, verbal), not when the instructor or activity says the RO will occur.
LEC/DISC	The instructor is lecturing to the whole class, including follow up discussion
CM	Instructor is involved in classroom management/administration tasks, such as erasing the board and setting up the AV. Not related to the content or methodology of the learning activity. Includes instructor's management of time or pacing.
Activity Type	Note: If instructors are giving mini- or full- lectures, no activity type will be coded.
POGIL	Instructor using Process Oriented Guided Inquiry Learning
CLA	Instructor is using student-to-student collaborative learning approach other than POGIL.
IND	Instructor presents a task for students to work on individually.

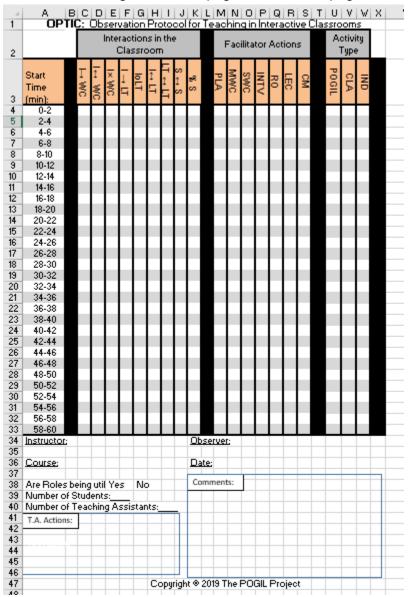| KEY	
Facilitator Actions	**Interactions**
PLA, Preparing for Learning Activities **MWC**, Movement throughout Whole Classroom (WC) **SWC**, Static while observing WC (w/o movement) **RO**, Reporting Out **INTV,** Intervention (whole class) **LEC/DISC**, Lecture and followup discussion **CM**, Classroom Management/Administrative Tasks	→, communicating to ↔, interacting with **I**, Instructor **S**, Student **LT**, Learning Team **WC**, Whole Class **x**, no interaction

OPTIC APP

- This app will be available at optic.kussmaul.org. Real time data can be collected in the app during an observation. The OPTIC app provides a visual in the form of a chronological timeline displaying all the codes marked during the observation in the interval in which they occurred.

OPTIC Excel Code Sheet

- An excel spreadsheet to record codes during observations. This form will be available online using POGIL webpage link on cover page.

Pre-Post Observation Form

- The Pre-Post Observation form is a document that is optional for use by the observer and facilitator to discuss the lesson that will be observed and the debrief that would follow the classroom observation. This form will be available online using POGIL webpage link on cover page.

Pre and Post OPTIC Observation Conversation for the Observer and the Instructor

Name (Instructor):_____

Course:_____ Room:_____# Students:_____ Date:_____ Duration:_____

Name (Observer):_____

Pre-observation:
- Instructional Objective: (*About what content/topic will the students be constructing knowledge?*)
- Process Skill Objective: (*What Process Skill(s) will the instructor address and how?*)
- Non-Compliance during class: (*What is the instructor's plan when students are being non-compliant?*)
- How will instructor begin the lesson?
- How will instructor close the lesson?
- If the instructor plans to use multiple collaborative learning approaches, what activity types does the instructor want coded separately? (*in-class small group, think-pair-share approach, paired or group problem solving, in-class peer-led instruction, problem/project-based learning, etc.?*)

Post Observation (with Evidence):
- Were the instructional objectives addressed using the activity?
- During the activity, were process skill objectives addressed?
- During the class, was non-compliant behavior identified and addressed?
- How much time are students engaged in active learning; how much time was used for lecture, classroom management, or other passive activities for students?
- What interactions suggest collaborative learning is occurring?

Post Observation reflection for class session:
- Strengths with reasons why it is a strength:
- Improvements with suggestions for improvement:
- Insights into teaching and learning: