TEACHING DIMENSIONS OBSERVATION PROTOCOL (TDOP) 2.1 USERS GUIDE

The Teaching Dimensions Observation Protocol (TDOP) is a descriptive classroom observation protocol that provides robust and nuanced depictions of instructional behavior. Classrooms and lecture halls are complex learning environments, and descriptions of what actually happens during a class period can provide valuable insights into the nature of these environments for a variety of purposes including institutional assessment, professional development, and research/program evaluation.

The TDOP was developed in 2009 as part of a NSF-funded study of the cognitive, cultural, and contextual underpinnings of postsecondary teaching practice. The TDOP was originally based on a protocol used to study middle-school science classrooms (see Osthoff et al., 2009). The protocol is designed to provide descriptions of teaching practice rather than an evaluative judgment of the quality of teaching, and this design choice is based on the idea that existing instruments did not adequately measure critical dimensions of teaching behavior in a rigorous and objective manner. In the ensuing years, the TDOP has been extensively used by hundreds of researchers in the U.S. and Canada, and it has been adapted for a variety of different applications. **The TDOP is available in online form at tdop.wceruw.org, and we recommend that the website be used for ease of data entry, management, and data exporting and visualization.** Further, inter-rater reliability (IRR) checks have been automated on the website, which greatly reduces training time. (See the "How to Use the 2.1 TDOP Website" document for information on how to navigate the website and use it for these purposes).

> This document includes the hard-copy version of the protocol, brief descriptions of technical information and user guidelines, and an appendix that includes examples of how TDOP data can be reported and visualized. This document also emphasizes how the TDOP can be used for peer observations and/or professional development purposes. Particularly important points about using the TDOP for these purposes are highlighted in these "call-out" boxes.

BACKGROUND TO THE TDOP

The TDOP allows users to characterize the nature of the learning environment rather than judge or evaluate the quality of instruction. In developing an approach to describing the classroom, we draw upon systems-of-practice theory from distributed cognition which views educational practice as the complex interactions among actors (teachers and students), instructional artifacts, and aspects of the task at hand. This distributed and synergistic conception of action can be contrasted to the common view of teaching as the deployment of teaching methods by an individual (e.g., lecturing) or simply as student behaviors in the classroom. We suggest that this overly simplistic view of teaching has led to assumptions that teaching itself can be reduced to a single variable (e.g., lecturing), but these notions do not accurately represent the nature and diversity of educational practice. Additionally, overly coarse descriptors such as "lecturing" are then often causally linked to specific student learning outcomes, such that the variety of teaching methods and pedagogical activities that may take place within a "lecture" is obscured and their potential impacts on student learning lost. By de-constructing the lecture the TDOP pinpoints the nature of teaching more precisely.

The TDOP also adopts a dimensional view of teaching practice in that different "layers" or dimensions of teaching can be discerned and empirically studied, from more basic to more subtle or complex aspects of the learning environment. In developing the instrument, we have at various times focused on six distinct dimensions of teaching, but it is challenging to measure the entirety of these dimensions as they unfold in real-time. Thus, some degree of simplification is necessary in order for observers to be able to adequately and reliably measure teaching behaviors. As a result, the TDOP is structured in a way to allow users to identify the degree of complexity (and attendant difficulty in attaining reliability across raters) that they wish to capture in the classroom, starting with the "Basic Dimensions" that capture the following essential features of practice:

1) The instructors' teaching methods and activities, which can be either teacher- or student-focused in terms of the primary actor (i.e., Instructional Practices dimension);
2) The nature of student-teacher interactions/dialogue, which can be either teacher- or student-led in terms of the primary speaker (i.e., Student-Teacher Dialogue dimension); and,
3) Instructors' use of technology and other artifacts for teaching (i.e., Instructional Technology dimension)
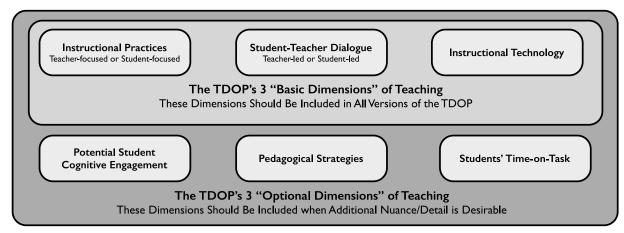

Figure 1: The 6 Dimensions of the TDOP – 3 "Basic Dimensions" and 3 "Optional Dimensions"

Additional dimensions of practice can be added to these Basic Dimensions, as they add important nuance to analyses of real-world classroom dynamics. These Optional Dimensions include the following:

4) Students' potential cognitive engagement (i.e., Potential Student Cognitive Engagement dimension);
5) The instructors' teaching style (i.e., Pedagogical Strategies dimension); and,
6) Students' time on task (i.e., Student Engagement dimension).

We emphasize that underlying each of these dimensions of instructional practice is the content itself and the unique organizational context in which teaching and learning take place. As a result, a meeting with the instructor to determine his/her goals, planned activities, and the nature of the observed class is recommended. Similarly, because students play a critical role in the instructional process, a survey or focus group is also recommended in order to identify the nature and influence of the instruction on their learning. These three aspects of teaching and learning – class context and goals, classroom instruction, and student experiences – comprise the Instructional System of Practice (ISOP) approach, of which the TDOP is a critical piece.

WHAT CAN I USE THE TDOP FOR?

The TDOP can be used for a variety of applications in both K-12 and postsecondary classrooms:
1) To diagnose or assess the "state of the art" of teaching practices at the individual, group/department, or institution level;
2) To assess changes in teaching practices over time as a result of an instructional intervention or other factor(s); and,
3) To provide formative data for peer observations and/or professional development consultations with instructors.

What can the results tell me?

Once results are generated from the TDOP, a critical phase of analysis and interpretation commences. Decisions that need to be made by users include (a) at what level to aggregate results (e.g., across courses, individuals, disciplines), (b) whether a comprehensive snapshot of teaching is desired or if more targeted aspects of instruction (e.g., interactive teaching) are of interest, and (c) whether or not the time-sampled nature of the data should be a core aspect of the analysis. In our experience and that of other users, some of the findings or conclusions that TDOP data can provide include:
- The prevalence of particular teaching practices such as lecturing and question-asking;

- The nature of interactions between pairs of codes across various dimensions;
- Differences in teaching practices across different disciplines, course levels, and institutions;
- How an individual's teaching fluctuates over time throughout a class period; and,
- The degree to which an individual's or group's teaching is indicative of desirable practices such as students working together, effective lecturing techniques, or learner-centered instruction.

Regarding the final application, we argue that certain aspects of teaching, such as the notion of "learner-centered instruction" cannot be ascertained through the sole use of the Basic Dimensions, but also require some of codes contained in the Optional Dimensions that may be more difficult to apply, especially cognitive engagement and pedagogical strategies. Even then, we caution that descriptive data of overt teaching behaviors can only provide partial insights into issues such as the quality or efficacy of instruction, and that information regarding student learning and/or experiences in the classroom (among other types of information) is required to advance any arguments on these points. See "Code Keys" on page 12.

> For peer observations and/or professional development applications, it will be important to determine in advance what types of results or conclusions will be meaningful to the instructor being observed. These may include: students' time-on-task, amount of time spent lecturing, or a birds-eye view of their overall teaching behaviors. **One of the strengths of the TDOP is that the instrument can be customized in many ways to fit different needs and interests of observers and those being observed alike.**

HOW DO I USE THE TDOP?

Step 1: Clarify rationale for conducting observations and desired outcomes
The first step in using the TDOP is to clarify the rationale for conducting classroom observations as well as the types of conclusions you wish to draw from the results.

> If you are using the TDOP for peer observation and/or professional development purposes, it is at this point that we recommend you meet with the instructor to discuss the goals of the observation and what TDOP dimensions and codes would be most useful to capture.

Also, at this early stage you should *carefully consider who is doing the observation*. The factors that should be considered include: (a) the disciplinary expertise of the observer, (b) the "closeness" of the observer to the person being observed (e.g., are they members of the same department), and (c) the level of training that the rater has undergone to conduct observations.[1] For peer observations and/or professional development, it may be desirable to have external third party observers who are considered to be "objective" in relation to the person being observed. Finally, it may also be critical to ensure that the observer has some background in the discipline.

Step 2: Select which of the 6 dimensions in the TDOP are necessary to meet your needs
Determining your rationale and specific aims will suggest which, if any, of the 3 "Optional Dimensions" should be added to the "Basic Dimensions" of the protocol.

Step 3: Select which codes in the selected dimensions are required
Then, because the codes which fall under any of the 6 dimensions are themselves customizable, it will be necessary to decide which codes to include, which to exclude, and whether or not new codes are necessary.

Step 4: Either use the existing TDOP templates or created a customized template with unique combinations of dimensions and codes
Next, you can remove individual codes from any category that you find unnecessary for your purposes, and (with the proper consideration) add any code that captures a facet of teaching that is not currently addressed by any of the existing

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[1] A recent review of reliability of evaluative protocols used in K–12 settings found that another factor, that of pre-existing beliefs about what constitutes high-quality teaching, is a major reason for the high degree of variability observed in the use of some observation protocols (Cash, Hamre, Pianta, & Meyers, 2012).

codes. There may be codes that you as a specialist (e.g., disciplinary expert, faculty developer) will want to add. We encourage this type of adaptation in order to extend the TDOP into more specialized applications. Thus, the instrument is completely customizable so that you can tailor the protocol to meet the needs of your own situation or goals.

However, important psychometric considerations follow from the decision to create new codes. Each of the current codes included in the TDOP has been developed in consultation with education experts in order to establish face validity. If new codes are added, ensure that they capture a valid (according to experts) aspect of instruction and represent a mutually exclusive observable behavior relative to other codes in that category. Finally, as you add the optional dimensions, the protocol becomes more challenging to use, and attaining adequate inter-rater reliability becomes more difficult. Thus, a trade-off exists between nuance/complexity and the ease of use.

Step 5: Participate in training where all raters become acquainted with the protocol and engage in inter-rater reliability (IRR) testing
Training in the TDOP can be conducted by your own research team with careful preparation and management. The steps outlined below are based on more than three years of experience in training research groups to use the TDOP. Assistance with training may be available, as well as guided training sessions for larger groups of observers. For more information on assistance with training contact the TDOP developers.

> In cases where observations are being used for peer mentoring or professional development, and where only one observer is involved and results are not intended for publication, it is possible to reduce training time. In these cases, the observer should spend some time getting acquainted with the codes and coding process, and do some practice coding prior to conducting the actual observation. Another model for these applications is to have a small team of observers undergo more rigorous training, whereupon they can provide observation services to departments or institutions.

While we do not specify a standardized length of training to attain adequate IRR, in our experience the training process does not take a matter of hours, but instead days. **The length of the training period will largely be determined by your decision about whether or not to add any of the Optional Dimensions, which will increase training time considerably.** Thus, if your TDOP includes only the Basic Dimensions, the training time will be less than a more complex version of the instrument. In our experience using the more complex versions, the training period lasts from 3-5 days for research teams of four people. Ultimately, we feel that given the desire to obtain rigorous and reliable measures of teaching, users should be prepared to invest time in the training process just as one would pay close attention to any measurement issues in conducting scientific research.

The basic steps of training include the following:
1. Have observers review all selected codes and discuss code definitions and coding rules extensively.
2. Select a video-taped class (similar in size, level and discipline to the ones being observed) and conduct a 15-minute practice coding session.
3. At the end of the practice coding, discuss results and identify any problematic understandings of codes, or observed situations that were not easily categorized.
4. Select another video-taped class segment and do another practice-coding session, followed by discussion.
5. Repeat steps 2-4 until the team feels comfortable and ready for coding an entire class. When ready the coding team should code a video-taped class in its entirety, followed by additional discussion.
6. When the coding team feels a certain level of agreement it is time to conduct inter-rater reliability (IRR) testing. It is recommended to use the TDOP website, given the built-in capabilities of testing IRR. To do this, all users must log-in to the site, create an observation (with identical TDOP dimensions and codes), and then independently code a class. The administrator can then test IRR between all pairs of raters using either Cohen's kappa or the Jaccard similarity statistic.
7. Repeat step 6 until an acceptable level of IRR has been reached between all pairs of raters (.85 or higher is desirable).

Step 6: Conduct observations

After training, the raters will be ready to conduct an observation. We recommend that a pre-observation meeting be conducted with the observed teacher in order to collect important information about the class (e.g., course level, goals, planned activities). These data can be entered on the TDOP "Cover Sheet." Then, using a hard copy or an online version of the TDOP, every two minutes users will circle or click on a code as it is observed in the classroom. In any given interval a number of codes may be circled or clicked depending on the complexity of the instructional practice being observed. Thus, in any given 2-minute interval you may be coding multiple codes within a single dimension.

In addition, depending on the nature of the study being conducted, **users should make notes** (as time allows) during each interval. These notes may focus on the content being discussed, the types of questions posed by students, and so on, depending on the types of information required to add depth and detail to the TDOP codes.

Since teaching will take many forms in different classrooms, you will invariably encounter situations or teaching scenarios that are confusing or difficult to code. To support users, we have developed a "Coding Rules" document that discusses how to use TDOP codes in commonly encountered situations. This document is available at the TDOP website.

Step 7: Analyze and interpret data

Finally, the data will need to be analyzed and interpreted by users. Depending on the purpose of your observation (e.g., research, evaluation, peer observation, institutional assessment), the nature and format of your analyses will likely vary.

> In our and other users' experiences, data produced from the TDOP for peer observations should be easily interpreted, directly applicable to the teachers' instructional goals, and also should be accompanied by actionable steps to take to improve their teaching.

In some cases, users have also reported that some teachers do in fact desire some sort of evaluative judgment about the quality of their teaching. While the TDOP is not designed to produce such judgment, the data can be interpreted with external criteria for "teaching efficacy" in mind. In these cases, however, we caution against extrapolating too much from descriptive results about teaching to efficacy or quality. See Appendix A for some different ways to analyze and report the data. Many of these analytic functions will be automated in future upgrades to the TDOP website, whereas others will require an analyst/observer working with raw data.

> For ideas regarding data reporting and analysis process please consult Appendix A, or get in touch with the TDOP developers. Training and technical assistance may be available in the event you would like one or more observers trained to use the TDOP and/or to analyze and graphically depict your data.

NOTE ABOUT REVISIONS TO THE TDOP 2.1

After extensive field-testing and feedback from users, the following changes were made to the protocol:

- Reduced mandatory dimensions of teaching from six to three core categories in order to simplify the use of the protocol;
- Reduced redundancy in code application by separating out these base categories from optional dimensions;
- Refined code names, definitions, and coding rules for clarity;
- Created tools for interpreting TDOP coding results called "code keys" – these keys are combinations of codes that can provide information about certain aspects of teaching that users have suggested are of interest:
  - The degree to which classroom activities are teacher- or student-focused;
  - The degree to which students participate in classroom dialogue;
  - Whether or not the teaching is well organized;
  - The different types activities students are engaged in such as actively working together, being engaged in problem-solving, making connections between the material and their own lives
- Finally, the TDOP website is being upgraded to reflect these changes and the website will now include capabilities for improved data reporting and visualization, as well as easy-to-use customization procedures.

TDOP Cover Sheet

On this cover sheet please fill in information about the purpose of the observation, instructor characteristics, and course characteristics. Some of this information will require a meeting/interview with the observed instructor, which is optional but recommended.

I. Observer Information

1) Observer name: _____

2) Date and time of observation: _____

IIa. Instructor Characteristics

1) Instructor name: _____

2) Appointment type: _____

3) Years teaching this course: _____

IIb. Instructor Characteristics – Goals and plans

1) Goals for the observed class: _____

2) Planned activities for the observed class: _____

3) How the class fits into the larger course (e.g., exams, special activities): _____

4) How instructor uses data, if at all, to refine and/or inform teaching: _____

III. Course Characteristics

1) Class name and level: _____

2) Department: _____

3) What is the total number of students in the class at the time of the observation?

O 25 or fewer   O 200-300
O 26–50   O 300-400
O 51–100   O 400 -500
O 100-200   O 500 +

4) Please describe the physical layout of the room (e.g., type of student seating, technology directly accessible by students, instructor on dias, number of projection screens and their positioning, etc.)

5) Please note if there is anything unusual about this particular class/lecture (e.g., quiz day, first day of semester, etc.)

Code Bank (Basic Dimensions plus Optional Dimensions)

The following list of codes includes only code definitions. For a more extensive discussion of coding rules and different instructional scenarios that will likely be encountered, please consult the "TDOP Technical Manual" which is available on the TDOP website.

Teaching Methods

Teacher-focused instruction (teacher is the primary actor)

L   **Lecturing**: The instructor is talking to the students and not using visuals, demonstration equipment, actively writing, or asking more than 2 questions in a row in a Socratic manner.

LW   **Lecturing while writing**: The instructor is talking to the students while actively writing on a chalkboard, transparencies, digital tablet, or other material. The instructor must either be writing or referring to what they are writing (or have already written). This code also captures real-time drawing of graphics (e.g., molecular structure, physiological processes), and if the use of visual representations is of interest, this should be included in the notes section. (Note that this code also captures writing/drawing in front of students without speaking, as a separate code for silent writing was deemed superfluous).

LVIS   **Lecturing from pre-made visuals**: The instructor is talking to the students while referencing visual aides, such as slides, transparencies, posters, or models (e.g., plastic model of molecular structure, examples of sedimentary rocks, multi-media). The instructor must be referring to the topic contained in the visual, but the visual serves only as a reference point for the material and not as a live demonstration of phenomenon.

LDEM   **Lecturing with demonstration of phenomena**: The instructor actively uses equipment (e.g., lab equipment, computer simulation) to convey course content. The objects must be in active use in relation to the topic and must be used for more than a simple reference point (e.g., "here is an example of a sedimentary rock") to demonstrate a process or phenomenon in class (e.g., "here is how sedimentary rock erodes over time" while physically demonstrating this process).

SOC-L   **Socratic lecture:** The instructor is talking to the students while asking multiple, successive questions to which the students are responding. Student responses are either guiding or being integrated within the discussion. <u>A minimum of 2 relevant student responses is required to use this code.</u> (Note that SOC-L can be co-coded with other types of lecturing, such as LW, if the instructor is doing both writing AND interspersing his/her talk with questions).

WP   **Working out problems:** This code refers to the instructor working out computations or problems. These can include balancing a chemical equation, working out a mathematical proof, or designing equations or Punnett squares, etc. The intent of the code is to capture the working through of some sort of problems in front of students. (If the computations/problems are on a slide and the instructor is actively working through problems, then this will be co-coded with LVIS. If this process is being written out, then this code will be co-coded with LW, and if students are being asked to participate in the problem-solving process via questions, code SOC-L).

IND   **Individualized instruction:** The instructor provides instruction to individuals or groups and not the entire class. This often occurs while the instructor is roaming the classroom, but students or small groups may also approach the instructor. This code is usually co-coded with SGW or DW (see below). It is important to recognize that this code should not be used to classify the types of student-teacher interactions that are occurring in a large class setting – instead, use this code only when students are engaged in SGW or DW and the instructor is directly interacting with one or more students.

MM   **Multimedia**: The instructor plays a video or movie (e.g., Youtube or documentary) <u>without speaking</u> while the students watch. If the instructor is talking over a video, movie, or simulation, then co-code with LVIS.

A   **Assessment**: The instructor is explicitly gathering student learning data in class (e.g., tests, quizzes, or clickers).

AT   **Administrative task:** The instructor is discussing exams, homework, or other non-content related topics.

Student-focused instruction (students are the primary actor)

SGW   **Small group work/discussion**: Students form into groups of 2+ for the purposes of discussion and/or to complete a task.

DW   **Deskwork:** Students complete work alone at their desk/chair.

SP   **Student presentation**: Groups or individual students are giving to the class or are otherwise acting as the primary speaker or instructor in the classroom. In this instance, only select this code and none others as long as the primary instructor is not actively taking the lead in teaching the class.

Student-Teacher Dialogue

Teacher-led dialogue

IRQ   **Instructor rhetorical question**: The instructor asks a question without seeking an answer and without giving students an opportunity to answer the question.

IDQ **Instructor display question:** The instructor poses a question seeking information. These questions can: seek a specific fact, a solution to a closed-ended problem, or involve students generating their own ideas rather than finding a specific solution.

ICQ **Instructor comprehension question**: The instructor checks for understanding (e.g., "Does that make sense?") and pauses for at least five seconds, thereby indicating an opportunity for students to respond.

Student-led dialogue

SQ **Student question**: A student poses a question to the instructor that seeks new information (i.e. not asking to clarify a concept that was previously being discussed) **and/or** clarification of a concept that is part of the current or past class period.

SR **Student response to teacher question**: A student responds to a question posed by the instructor, whether posed verbally by the instructor or through digital means (e.g., clicker, website).

PI **Peer interactions**: Students speaking to one another (often during SGW, WCD, or SP).

Instructional Technology
CB **Chalkboard/whiteboard/Smart Board**
OP **Overhead projector/transparencies**
PP **PowerPoint or other digital slides**
CL **Clicker response systems**
D **Demonstration equipment**: These could include chemistry demonstrations of reactions, physics demonstrations of motion, or any other material being used for the demonstration of a process or phenomenon. The objects must be in active use in relation to the topic. This can also include objects such as rocks being passed around a classroom.
DT **Digital tablet:** This refers to any technology where the instructor can actively write on a document or graphic that is being projected onto a screen. This includes document cameras as well as software on a laptop that allows for writing on PDF files.
M **Movie, documentary, video clips, or Youtube video**
SI **Simulation:** Simulations can be digital applets or web-based applications.
WEB **Website:** Includes instructor interaction with course website or other online resource (besides Youtube videos). This can include using a website for student responses to questions (in lieu of clickers).

Optional Dimensions
Potential Student Cognitive Engagement
CNL **Making connections to own lives/specific cases**: Students are given examples (either verbally through illustrative stories or graphically through movies or pictures) that clearly and explicitly link course material to popular culture, the news, and other common student experiences. Students may also be given specific cases or incidents in order to link an abstract principle or topic (e.g., flooding) with a more readily identifiable instance (e.g., 2013 floods in Boulder, Colorado). For this code to be used, the observer will need to make a judgment that the specific case is something meaningful to students, such as a local historic item or location, or a widely recognized incident. In general, a high bar is required here that is based on specificity and salience to students, such that showing a picture of a sedimentary rock will not be sufficient for this code, but if the picture was of the Grant Canyon and named as such, it would be coded as CNL. This code will be particularly important in biology (e.g., Dolly the sheep) and geoscience courses.
PS **Problem solving:** Students are asked to actively solve a problem (e.g., balance a chemical equation, work out a mathematical equation/algorithm). This is evident through explicit verbal (e.g., "Please solve for X") or written requests (e.g., worksheets) to solve a problem. **This is coded in relation to closed-ended exercises or problems where the instructor has a specific solution or end-point clearly in mind.**
CR **Creating**: Students are provided with tasks or dilemmas where the outcome is open-ended rather than fixed (e.g., students are asked to generate their own ideas and/or products rather than finding a specific solution). The task can be delivered verbally or in written form. **This is coded in relation to open-ended exercises or problems where the instructor does not have a specific solution or end-point clearly in mind.**

Pedagogical Strategies
HUM **Humor**: The instructor tells jokes or humorous anecdotes; this code requires laughter from at least a couple of students.
ANEX **Anecdote/example:** The instructor gives examples (either verbally through illustrative stories or graphically through movies or pictures) that clearly and explicitly link course material to (a) popular culture, the news, and other common student experiences, or (b) widely recognized cases or incidents that illustrate the abstract (both types are co-coded with CNL).

ORG   **Organization**: The instructor writes or posts an outline of class (i.e., advance organizer) or clearly indicates a transition from one topic to the next verbally or through transitional slides. This transition from one topic to another can indicate a change in topics within a single class or from a previous class to the present class. These transitions must be verbally explicit statements to the class (e.g., "Now we're moving from meiosis to mitosis") as opposed to ambiguous statements such as "Now we'll pick up where we left off on Monday." This may also include statements concerning how concepts covered in different portions of the class (e.g., lecture, homework and lab) may overlap.

EMP   **Emphasis:** The instructor clearly states that something is important for students to learn or remember either for a test, for their future careers, or to just learn the material well.

Student Engagement

VHI   **Very High:** More than 75% of the students in the immediate area of the observer are either (a) actively taking notes, or (b) looking at the instructor/course materials

HI   **High:** Between 50% and 75% of the students in the immediate area of the observer are either (a) actively taking notes, or (b) looking at the instructor

MED   **Medium:** Between 25% and 50% of the students in the immediate area of the observer are either (a) actively taking notes, or (b) looking at the instructor

LO   **Low:** Less than 25% of the students in the immediate area of the observer are either (a) actively taking notes, or (b) looking at the instructor

TDOP – Basic Version

(This template includes ALL codes for 3 Basic Dimensions; see tdop.wceruw.org to download this and other templates or to download a blank form to which you can then add columns for additional Dimensions and/or populate with desired codes)

Directions: Circle codes for each behavior observed during every two-minute interval. Take detailed notes about aspects of the class that is of particular interest for your application (e.g., content discussed, nature of student dialogue).

Interval #	1	2	3	4	5
Min	0-1:59	2:00-3:59	4:00-5:59	6:00-7:59	8:00-9:59
Instruct. Practices – Teacher-focused	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT
Instruct. Practices – Student-focused	SGW DW SP	SGW DW SP	SGW DW SP	SGW DW SP	SGW DW SP
Notes :					
Student-Teacher Interactions Teacher-led	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ
Student-Teacher Interactions Student-led	SQ SR PI	SQ SR PI	SQ SR PI	SQ SR PI	SQ SR PI
Notes:					
Instructional Technology	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB
Notes:					

Interval #	6	7	8	9	10
Min	10:00-11:59	12:00-13:59	14:00-15:59	16:00-17:59	18:00-19:59
Instruct. Practices – Teacher-focused	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT	L LW LVIS LDEM SOC-L WP IND MM A AT
Instruct. Practices – Student-focused	SGW DW SP	SGW DW SP	SGW DW SP	SGW DW SP	SGW DW SP
Notes :					
Student-Teacher Interactions Teacher-led	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ	IRQ IDQ ICQ
Student-Teacher Interactions Student-led	SQ SR PI	SQ SR PI	SQ SR PI	SQ SR PI	SQ SR PI
Notes:					
Instructional Technology	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB	CB OP PP CL D DT M SI WEB
Notes:					

Post-Observation Field Notes

Note any over-arching observations about the class just observed or any specific incidents or activities that are worth elaborating upon. Also keeping in mind the purpose of the evaluation, make summative observations about the class. Finally, if a post-class survey such as the RTOP or Teaching Behaviors Inventory (TBI) is of interest in order to assess the efficacy of the class, administer the survey at this point.

Code Keys that Capture Important Aspects of Teaching

One of the strengths of the TDOP is that combinations of codes can be used to capture important aspects of instruction, either within a single dimension or across multiple dimensions. By combining various codes from the TDOP, one can draw more robust conclusions about the teaching practices observed. Importantly, while drawing upon variables from a single dimension (e.g., instructional practices) may provide useful insights, codes across dimensions will result in more multifaceted descriptions. **It is important to note that using the Basic Dimensions alone will provide some useful and interesting results, but a more nuanced and rigorous perspective on these aspects is possible through the use of the Optional Dimensions**. This is particularly the case with one particular idea or view of teaching that is of great interest to many researchers and policymakers – "learner-centered instruction." **These keys are a work in progress**, but preliminary ones are listed below, and some are included in the publication by Hora (2013).

1) Different types of lecturing
   a. Lecturing that may facilitate students' actively applying information to solve problems: any lecturing codes co-coded with PS (Potential Student Cognitive Engagement).

2) Types of teaching that facilitate student engagement (i.e., interactive teaching - see Hora, 2013):
   a. Students problem solving: WP, DW (Instructional Practices Dimension), PS (Potential Student Cognitive Engagement Dimension)
   b. Students making connections: ANEX (Pedagogical Strategy Dimension), CNL (Potential Student Cognitive Engagement Dimension), LDEM (Instructional Practices Dimension).
   c. Students working together: SGW, PI (Student-Teacher Interactions Dimension)

3) Instruction that is organized and clear*: ORG, ANEX, and EMP (Pedagogical Strategy Dimension)

4) Basic descriptions of teacher-focused behaviors** (i.e., behaviors where the teacher is the primary actor/focus):
   a. All teacher-focused instructional practice codes, plus all teacher-led dialogue codes

5) Basic descriptions of student-focused behaviors (i.e., behaviors where the student is the primary actor/focus):
   a. All student-focused instructional practice codes, plus all student-led dialogue codes and all potential student cognitive engagement codes.
   b. Also, time-on-task measures can be used as an additional data point for this category.

6) General features of student or learner-centered instruction***:
   a. Superficial measure: "high" rates (as determined by the analyst) of codes outlined in #5 above
   b. Deeper measure: "high" rates (as determined by the analyst) of student-based codes as well as additional codes such as effective lecturing (ORG, EMP – Pedagogical Strategy Dimension), and potentially deeper types of cognitive engagement (PS, CR, CNL – Potential Student Cognitive Engagement Dimension)

* This key is based on extensive literature on effective classroom instruction (e.g., Murray, 1997).
** All of the codes in the TDOP capture teacher behaviors. That is, even those codes considered "student-focused behaviors" are the result of the teacher making a pedagogical decision in regard to student action. For example, SGW is not the result of students' self-organizing in the classroom, but it is the result of a teacher's decision. That said, these combinations of codes capture behaviors where either the teacher or the student is the primary actor.
*** It is important to note that the concept of "learner-centered instruction" is very complex and involves not only classroom teaching but also curriculum design, assessment, and other facets of teaching and learning. Thus, we contend that using descriptions of overt teaching behaviors, which is what the TDOP provides, sheds only partial light on this complex topic. That said, we offer a way to provide some insights into learner-centered instructional practices through TDOP data. In addition, the codes selected for each of the measures (i.e., superficial and deeper) are not directly tied to the literature base on the topic, but are an approximation of which TDOP codes are most closely aligned with best practices as outlined in the literature.

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Research Featuring the TDOP

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Other Resources

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Teaching Dimensions Observation Protocol (TDOP)

TDOP is made available to researchers and educators under a limited educational license and shall not be copied, modified, or redistributed except for research and teaching purposes. Researchers are encouraged to customize the TDOP to fit their specific research and institution needs. However, if you plan on publishing a modification to the TDOP, please indicate that the modification is yours, but do not change the name of the instrument without prior written consent from the University of Wisconsin-Madison (UW).

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Citation for the instrument: Hora, M., & Ferrare, J.. (2014). The Teaching Dimensions Observation Protocol (TDOP) 2.0. Madison, WI: University of Wisconsin-Madison, Wisconsin Center for Education Research.

TDOP was largely adapted from Osthoff, E., Clune, W., Ferrare, J., Kretchmar, K., & White, P. (2009). Implementing immersion: Design, professional development, classroom enactment and learning effects of an extended science inquiry unit in an urban district. Madison: University of Wisconsin–Madison, Wisconsin Center for Educational Research.

TDOP Website: http://tdop.wceruw.org   **For more information contact:** hora@wisc.edu

Data from the TDOP can be analyzed in a variety of ways depending upon user needs. The results of these analyses can then be visualized and/or reported in many ways, including tabular, graph (e.g., bar, social network) and time-series formats. In this appendix we include some ways that we and other users have analyzed and reported TDOP data, *with a focus on peer observation or professional development applications.*

These types of analyses and reporting are contained within the framework of a hypothetical report to an instructor. This approach, which we call the "Instructional Systems-of-Practice" framework is not solely dependent upon TDOP data, but also includes other important elements that we have found instructors value. The amount of additional data you provide is dependent upon your own capacity and applications, but we strongly encourage that reports should include "action steps" or things that the instructor can o to improve their teaching.

> An important aspect of our approach to reporting data, particularly for peer observation or professional development purposes, is to make the results easily interpreted and meaningful to those being observed. We have found that teachers appreciate and benefit from when their descriptive observation data is contextualized in terms of the class itself (e.g., the day's goals and material), and in some cases, when data about how the students experienced the class is included.

Step 1. Managing data (data entry)
Note: If using the online version of the TDOP these instructions for data entry will not apply, as the website does this automatically.

The first step in data management is to transfer hard copy codes to a spreadsheet that is organized with individual codes as columns and 2-minute intervals as rows. Then, for each instance where a code was observed place a "1" in the corresponding cell and a "0" if it was unobserved. For example, if "lecturing" was observed in intervals 1 and 2, then a "1" should be placed in the two corresponding cells.

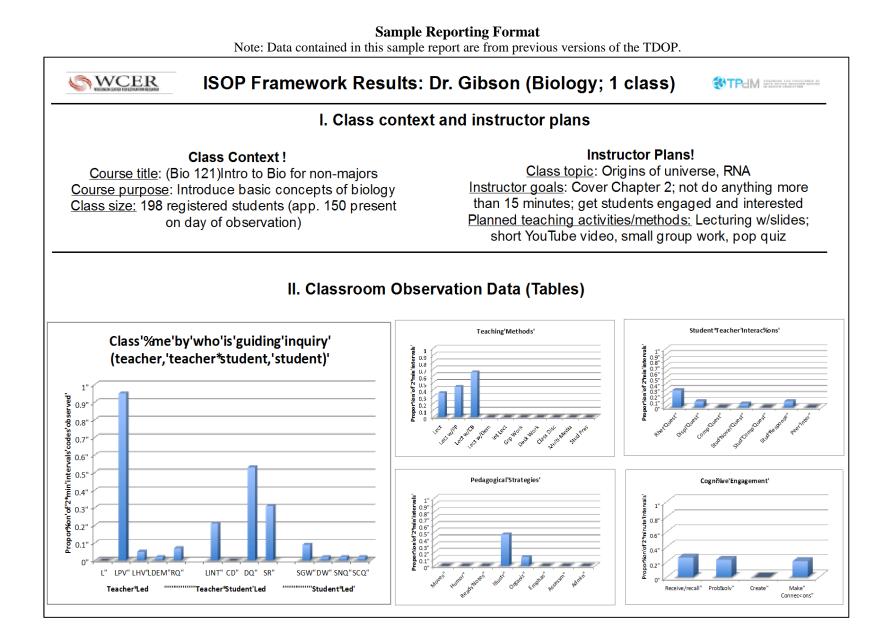**Step 2. Organizing data by dimension/code key of interest**
If you are interested in particular dimensions (e.g., Instructional Practices that are Student-Focused), then make sure to organize your spreadsheet with the corresponding codes near one another. This way, results (either raw code counts or proportions) can be more easily analyzed. Another way to organize the data within the spreadsheet is to write macros for certain code keys. For example, if you were interested in the code key of "Students working together" then you could write a macro that indicates a "1" if SGW OR PI were observed in a given interval, and "0" if unobserved. Also, if you are interested in data across multiple observations for a single individual or across individuals, then the spreadsheet will need to include the relevant data.

Step 3. Analysis and reporting
Once data are entered and organized, the data matrix can be analyzed in a variety of ways. One of the easiest ways is to simply compile the raw number of times a code was observed across all intervals and then divide by the number of intervals – this provides the proportion of times a code (or group of codes) were observed. Other ways to analyze the data include time-series reporting (i.e., how codes fluctuated over time). Data can be reported in a variety of ways including bar graphs, tables, and other formats.

In Appendix A on the following pages, an example of how to analyze and report TDOP data is presented. Note that this is but one of many ways to analyze and report these data.

It is also important to note that pie charts do not work with TDOP data unless observers are not coding multiple codes within a single dimension within any given 2-minute interval. That is because in most cases it is desirable to code multiple codes within a single interval, such that results for a given dimension will not sum to 100.

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ISOP Framework Results: Dr. Gibson (Biology; 1 class)

TPdM TEACHING FOR THE PRINCIPLES OF DATA DRIVEN DECISION MAKING IN HIGHER EDUCATION

I. Class context and instructor plans

Class Context !
Course title: (Bio 121)Intro to Bio for non-majors
Course purpose: Introduce basic concepts of biology
Class size: 198 registered students (app. 150 present on day of observation)

Instructor Plans!
Class topic: Origins of universe, RNA
Instructor goals: Cover Chapter 2; not do anything more than 15 minutes; get students engaged and interested
Planned teaching activities/methods: Lecturing w/slides; short YouTube video, small group work, pop quiz

II. Classroom Observation Data (Tables)

Class'%me'by'who'is'guiding'inquiry' (teacher,'teacher*student,'student)'

Teacher*Led   Teacher*Student'Led   Student*Led

Teaching'Methods'

Student*Teacher'Interac%ons'

Pedagogical'Strategies'

Cogni%ve'Engagement'

TDOP Version 2.1: Revised August 2014

ISOP Framework Results: Dr. Gibson (Biology; 1 class)

II. Classroom Observation Data (Social Network Graph)

II. Classroom Observation Data (Time-Sample)

Intervals	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37

Instructional Episodes:
Introduction; Clicker question on Baas-Becking; Students talking Instructors address misconceptions; Re-do clicker question; Discussion of Whitaker data and mutation rates; Address correct answer | Learning Goals; Origin of Universe; Clicker "What is life?" Students discuss | Historical Views of Origin of Life; Pasteur's Experiments | Shows Movie of Origins of Life | Discusses Miller-Urey Experiments; Polymers | Clicker Q on Cell Formation Peer Disc. | Discusses reproduction, RNA, evidence of cyanobacteria, and endosymbiosis | Clicker Q | Discusses Life on Mars Clicker Q

Teaching Methods
- Lecturing
- Lecturing w/ PowerPoint
- Interactive Lecture
- Small Group Work
- Multi Media

Cognitive Engagement
- Articulating
- Listening Facts/Definitions
- Listening to Processes
- Creating
- Making Connections

IV. Observer Feedback and Action Items

!

1. Good job mixing up activities and meeting your goal of not doing anything for more than 15 minutes at a time
!

2. Many aspects of interactive teaching were unobserved (e.g., students working together), and so if that's one of your goals, pay closer attention to incorporating more small group work and/or problem-based activities.
!

3. Because the topic is inherently engaging (origins of the universe) take advantage of this and create more opportunities for student discussion (i.e., student-led dialogue)
!

4. YouTube video was distracting - most students checked out and went online
!

5. Students felt the class could be more challenging (see survey results)
!

6. Give students study tips - especially doing practice tests over time and not just re-reading lecture notes.

Note: This page is hypothetical feedback that a peer observer MAY provide to complement the data.