



Implementation Guide by Matthew Hora, Joseph J. Ferrare (Based on TDOP Users Guide) and Adrian Madsen downloaded from PhysPort.org

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Implementation

Purpose of the TDOP

To document teaching practice, support professional development, evaluate effects of instructional interventions and specify teaching practices that distinguish between control & experimental conditions.

Course Level: What kinds of courses is it appropriate for?

Graduate, Upper-level, Intermediate, Intro college, High school, Middle school, and Other

Content: What does it assess?

Teaching

Timing: How long should I give students to take it?

N/A minutes

Example Questions

Example TDOP codes:

Student-Teacher Interactions/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.

IR **Instructor response to student question:** The instructor is providing an answer or other feedback in response to a student question. This code may be co-coded with types of lecturing IF the instructor answers a question to interrupt their "lecturing" by answering the student. The difference between an instructor response and a Socratic lecture is who initiated the questioning: instructor-initiated dialogue is SOC-L whereas a student-initiated dialogue is IR.

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).

Access: Where do I get the assessment?

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.

Versions and Variations: Which version of the assessment should I use?

The latest version of the TDOP, released in 2015, is version 2.1. Version 1.0 was developed in 2009 and version 2.0 was released in 2014.

Administering: How do I give the assessment?

The steps to using the TDOP are taking from the [TDOP Users Guide](#) which contains much more detail about each step.

Step 1: Clarify rationale for conducting observations and desired outcomes

Step 2: Select which of the 6 dimensions in the TDOP are necessary to meet your needs

Step 3: Select which codes in the selected dimensions are required

Step 4: Either use the existing TDOP templates or created a customized template with unique combinations of dimensions and codes

Step 5: Participate in training where all raters become acquainted with the protocol and engage in inter-rater reliability (IRR) testing

Step 6: Conduct observations

Step 7: Analyze and interpret data

Scoring: How do I calculate my students' scores?

The three steps to score TDOP data are given here and further explanation of each is given in the [TDOP Users Guide](#).

Step 1. Manage data (data entry)

Step 2. Organize data by dimension/code key of interest

Step 3. Analyze and report results

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.

Clusters: Does this assessment include clusters of questions by topic?

There are codes around several major categories:

Teaching methods
Student-teacher dialogue
Instructional technology

Optional code categories include:

Potential student cognitive engagement
Pedagogical strategies
Student engagement

Typical Results: What scores are usually achieved?

Results from the TDOP are only a measure of what is happening in the classroom and not a rating of it. Instructors can use the results in combination with something like the Reformed Teaching Observation Protocol (RTOP) to see both a rating of your instruction and what exactly you are doing during class to help you improve. Also, many of the items on the TDOP are representative of practices that are known to generally be "better" or "worse" methods so the time spent on these items as shown in the TDOP results could show room for improvement.

Interpretation: How do I interpret my students' scores in light of typical results?

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.

Resources

Where can I learn more about this assessment?

M. Hora, [Toward a Descriptive Science of Teaching: How the TDOP Illuminates the Multidimensional Nature of Active Learning in Postsecondary Classrooms](#), *Sci. Educ.* **99** (5), 783 (2015).

The developers of the TDOP have created an [in-depth user guide](#) with many important instructions and details for using the TDOP.

Translations: Where can I find translations of this assessment in other languages?

We don't have any translations of this assessment yet.

If you know of a translation that we don't have yet, or if you would like to translate this assessment, please [contact us!](#)

Background

Similar Assessments

[RTOP](#), [COPUS](#)

Research: What research has been done to create and validate the assessment?

Research Validation: Gold Star ★

This is the highest level of research validation, corresponding to all seven of the validation categories below.

- Based on research into **classroom behavior**
- Studied using **iterative observations**
- Studied using **inter-rater reliability**
- Studied using **training materials**
- Research conducted **at multiple institutions**
- Research conducted **by multiple research groups**
- Peer-reviewed publication**

Research Overview

The codes and categories on the TDOP were developed based on an instrument designed to study inquiry-based middle school sciences courses. The developers then identified five key aspects of classroom dynamics and adapted codes from these categories from the original instrument. The codes were tested in classrooms and underwent expert review. The developers created a rigorous training program, which was completed by 56 raters from several disciplines. The raters completed iterative observations where they

observed classes across 4 disciplines, calculated inter-rater reliability, and completed more observations until sufficient inter-rater reliability was achieved. There are over 8 peer-reviewed publications about the TDOP.

Developer: Who developed this assessment?

Matthew T. Hora and Joseph J. Ferrare

References

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- M. Wilcox, G. Feldman, J. Von Korff, N. Klinger, O. Sengul, and J. Chini, [Characterizing Studio Physics Instruction Across Instructors and Institutions](#), presented at the Physics Education Research Conference 2016, Sacramento, CA, 2016.