What's OPDOC? A Rubric for Characterizing Online Professional Development

Kyra Gallion
University of Colorado Boulder

Tim Archie
UC Boulder

Sandra Laursen
UC Boulder

Professional development (PD) has the potential to improve teaching in STEM by helping educators gain knowledge and skills in research-based instructional strategies (RBIS). Instructor use of RBIS has been shown to improve student performance and support equity among students (Freeman et al., 2014; Laursen et al., 2014), and effective PD can help educators implement more RBIS in their classrooms. There has been a lot of research about what practices contribute to effective PD (e.g., Kennedy, 2016; Archie et al., 2022), but as more PD opportunities move online, new tools are needed to describe its characteristics. For instance, spontaneous group work may be quick to coordinate in person, but the same task would require a different set of tools and skills to be executed online. As a way to identify and describe some of these online characteristics, we have developed a rubric called the Online Professional Development Observation Checklist (OPDOC).

The OPDOC was created as an evaluative tool for a series of online PD workshops meant to improve the teaching of undergraduate mathematics instructors. The rubric is designed to be broad enough that it could be applied to a wide variety of online PD programs. It includes 19 items that are based on literature about effective PD practices, including strong logistics (Gaumer Erickson et al., 2017), interactivity among participants (Elliot, 2017; Gaumer Erickson et al., 2017), and support for implementation (Elliot, 2017; Ritzmann et al., 2013). The rubric also includes items that measure equity and inclusiveness, which were drawn from anti-racist rubrics (Blonder et al., 2022) to promote a supportive and collaborative PD environment.

The rubric was used in summer 2022 for both synchronous and asynchronous observation for over 156 hours of total observation of 8 different workshops on varied topics relevant to teaching college mathematics, each 24-30 hours long. There were two workshop models: an intensive model spanning 6 hours a day for 4 days, and a minicourse model spanning 3 meetings a week for 3 weeks. The content of the workshops, the facilitation teams, and the participants were also variable. The OPDOC was used to collect observations of the workshops based on four general categories: logistics, educative content, interactivity, and community-building. For each item within the categories, a numerical 3-point rating scale was used to indicate the strength of evidence for each item.

These numerical scores were then compared to survey responses from participants who attended the workshops. Results showed that the numerical distinctions among workshops were minimal in the logistics and interactivity categories, which could suggest a need for item revision or differential weighting of items. It is also possible that some of the lack of deviation in the OPDOC scores can be attributed to the training that workshop leaders attended beforehand, designed to support leaders in creating organized and interactive workshops. Additionally, as every workshop leader already had some PD experience, it is not unexpected that the workshops were highly rated on average. In future research, we hope to link workshop characteristics with instructor outcomes, so participant survey responses will be used to further identify central components of effective PD and the rubric will be refined to identify variations in greater detail for future workshop iterations.

References

Archie, T., Hayward, C. N., Yoshinobu, S., & Laursen, S. L. (2022). Investigating the linkage between professional development and mathematics instructors' use of teaching practices using the theory of planned behavior. *PLoS ONE, 17*(4). https://doi.org/10.1371/journal.pone.0267097

Blonder, B., Bowles, T., De Master, K., Fanshel, R. Z., Girotto, M., Kahn, A., Keenan, T., Mascarenhas, M., Mgbara, W., Pickett, S., Potts, M., & Rodriguez, M. (2022). *Advancing Inclusion and Anti-Racism in the College Classroom: A Rubric and Resource Guide for Instructors*. Zenodo. https://doi.org/10.5281/zenodo.5874656

Elliott, J. C. (2017). The evolution from traditional to online professional development: A review. *Journal of Digital Learning in Teacher Education*, *33*(3), 114–125. https://doi.org/10.1080/21532974.2017.1305304

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410–8415.

Gaumer Erickson, A. S., Noonan, P. M., Brussow, J., & Supon Carter, K. (2016). Measuring the quality of professional development training. *Professional Development in Education*, *43*(4), 685–688. https://doi.org/10.1080/19415257.2016.1179665

Kennedy, M. M. (2016). How does professional development improve teaching? *Review of Educational Research*, *86*(4), 945–980. https://doi.org/10.3102/0034654315626800

Laursen, S. L., Hassi, M. L., Kogan, M., & Weston, T. J. (2014). Benefits for women and men of inquiry-based learning in college mathematics: A multi-institution study. *Journal of Research in Mathematics Education*, *45*(4), 406-418.

Palmer, M. S., Bach, D. J., & Streifer, A. C. (2014). Measuring the promise: A learning-focused syllabus rubric. *To Improve the Academy: A Journal of Educational Development*, *33*(1), 14-36.

Ritzmann, S., Hagemann, V., & Kluge, A. (2013). The Training Evaluation Inventory (TEI) - evaluation of training design and measurement of training outcomes for predicting training success. *Vocations and Learning*, *7*(1), 41–73. https://doi.org/10.1007/s12186-013-9106-4
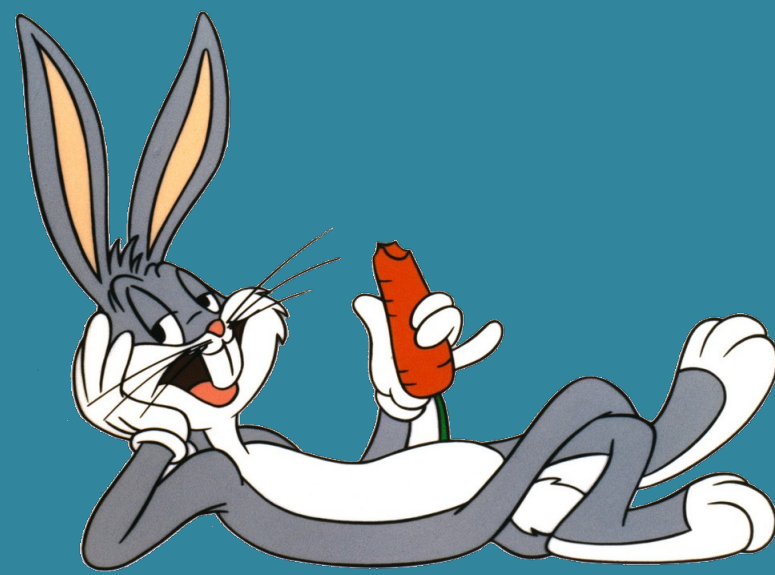
What's OPDOC? A Rubric for Characterizing Online Professional Development

Kyra Gallion, Tim Archie, & Sandra Laursen

Need

Professional development (PD) can help STEM educators gain knowledge and skills in research-based instructional strategies. A few dimensions of effective PD include:

- Strong logistics[1]
- Interactivity among participants[2]
- Support for implementation[3]

As more PD moves online, however, new tools are needed to describe its characteristics. This rubric was developed to evaluate online PD workshops meant to improve the teaching of undergraduate mathematics instructors.

Instrument Development

The OPDOC rubric was first used in the summer of 2022 to evaluate online workshops for a PD program. The observations included:

- 8 workshops on various topics about teaching college mathematics
- Over 156 hours of synchronous and asynchronous observation
- Variable workshop content, models, facilitations teams, and participants

Observations were then compared to post-survey feedback from participants who attended the workshops. Based on these comparisons, we made the following modifications:

- Revised broad categories to emphasize implementation of new practices learned in workshops
- Included new items based on frequently stated participant feedback
- Eliminated repetitive items
- Changed Strength of Evidence from a 3-point scale to 5-point to allow for greater nuance in coding

Acknowledgements

The Rubric

The Professional Development Provider:	Strength of Evidence
Logistics	
1. Follows a schedule that is comfortably paced and honors breaks	None (1)
2. Uses technology that is clear and accessible to participants	None (1)
3. Organizes information so that participants can easily find agendas, links, resources, etc.	None (1)
Content	
4. Provides activities that are relevant to the workshop content, well-paced, and worthy of participant time and conversation	None (1)
5. Describes learning activities clearly and their function within the workshop	None (1)
6. Includes the empirical research foundation of the content (e.g., citations, verbal references to research literature, key researchers)	None (1)
7. Provides information about effective teaching practices within the context of the topic	None (1)
8. Provides information about inclusive and equitable teaching practices within the context of the topic	None (1)
Interactions	
9. Incorporates opportunities for participants to interact with each other related to training content	None (1)
10. Provides guidance during activities to ensure all participants understand the task and are being treated equitably	None (1)
11. Invites participants to express personal perspectives (e.g., experiences, thoughts on concept)	None (1)
12. Includes opportunities for participants to safely ask questions and communicate their needs to facilitators	None (1)
13. Fosters an environment of community, rapport, and openness among the participants	None (1)
Implementation	
14. Provides examples of the content/practice in use (e.g., case study, vignette)	None (1)
15. Connects the topic to participants' context (e.g., course, department, institution) and addresses potential barriers to implementation	None (1)
16. Conveys an expectation that participants are to implement workshop lessons or material into their own contexts	None (1)
17. Includes opportunities for participants to consider and/or practice implementation within their own contexts	None (1)
18. Offers continued support after the workshop (e.g. resources, check-ins, communities of practice)	None (1)

Qualitative Survey Responses

"Frequent breakout rooms and breaks helped to make the long days work well."

"I was *slaughtered* mentally and physically most days... could use longer breaks [...]"

"The workshop descriptions doesn't seem to match the actual workshop."

"The organizers did an excellent job of teaching how to do active learning by explicitly using active learning techniques."

"I loved the interactivity and random group work to meet colleagues and hear fresh ideas."

"As a group we unfortunately fell into the habit of not responding to open prompts for volunteering comments. We needed to be prodded a little more […]"

"Giving us practical examples we can take directly to the classroom was wonderful."

"I think it would be helpful to maintain an online space for those of us in this workshop so we could share our experiences with implementing our tasks in the future."

"The workshop gave me a wealth of resources I can consult if I need help and a network of colleagues that I can reach out to!"

Quantitative Survey Responses

Workshop A and Workshop B Comparison

- Workshop A
- Workshop B

- My interactions with others
- The general atmosphere of the workshop
- The organization of workshop materials
- The workload of the workshop
- The pace of the workshop
- How workshop topics, activities, readings and assignments fit…
- The overall approach to teaching and learning

(scale: 3.0, 3.5, 4.0, 4.5, 5.0)

A comparison of post-survey responses from participants in two example workshops that ranked high and low within the initial sample of eight. The contrasts between the scores suggest participants are perceptive about differences in workshop design and facilitation that reflect elements we seek to document in OPDOC.

Conclusions and Future Work

Based on the data collected at summer 2022 workshops, feedback has already been given to the upcoming summer 2023 workshop teams to emphasize participants' needs for:

- Longer breaks
- More implementation strategies
- Follow-up support

The revised OPDOC will be used for workshops planned for summer 2023 and will be further revised as new observations and survey data are collected. Our intention is to develop a rubric that captures qualitative information to describe workshop features and that also provides quantitative scores, which together can predict or explain short-term outcomes (satisfaction, learning) and long-term outcomes (implementation of new practices).

References

[1] Gaumer Erickson, A. S., Noonan, P. M., Brussow, J., & Supon Carter, K. (2016). Measuring the quality of professional development training. *Professional Development in Education*, 43(4), 685–688.

[2] Elliott, J. C. (2017). The evolution from traditional to online professional development: A review. *Journal of Digital Learning in Teacher Education*, 33(3), 114–125.

[3] Ritzmann, S., Hagemann, V., & Kluge, A. (2013). The Training Evaluation Inventory (TEI) - evaluation of training design and measurement of training outcomes for predicting training success. *Vocations and Learning*, 7(1), 41–73.

University of Colorado Boulder