

SUPPLEMENTAL MATERIAL TO “ONLINE ADMINISTRATION OF RESEARCH-BASED ASSESSMENTS”

A. Practical how-to

Many of the strategies for implementing RBAs on paper [1] also apply to implementing RBAs online, though there are some unique strategies.

Provide points-based incentive: For points-based incentives, the point value should be small enough to keep participation low-stakes, but large enough to meaningfully motivate participation. We recommend on the order of a few percent of the total grade or the equivalent of a small portion of a homework assignment. Only give points for participation, not for correctness. Be sure to emphasize this to students through your class communications and in your syllabus.

Provide multiple reminders: If students are completing the surveys in their own time (not during class), we recommend sending multiple email reminders leading up to the deadline and making multiple announcements during class time. The repeat announcements help catch students who may have missed the first notification and indicate to students that you, as an instructor, value their participation. Because participation is often higher on pretests than posttests [2], we suggest sending more notifications and re-emphasizing incentives at posttest.

Use dedicated class time: Some instructors may be uncomfortable providing points-based incentives, in which case it may be easier to use class time. Research has indicated that participation rates are similar whether the students complete the RBAs during or outside of class time (with appropriate incentives). While unnecessary, it is still appropriate to use time during a scheduled class session for students to complete the surveys online. To administer instruments online, instructors can share the link during the class session (such as during the first lab or tutorial).

Communicate the goals: When announcing the RBA to students, explicitly explain the goal is to obtain important information about the course and the instruction to better serve the students in the class (in the present and the future). Briefly describe the benefit of their participation to you, the instructor (in terms of feedback for the course), and to them, the students (in terms of study opportunities). Explicitly state that the goal is not to evaluate the students individually. Encourage students to answer all the questions, even if they are not confident in their responses, so you can adapt instruction accordingly.

Refer to the surveys through generic names: When describing the RBA, use a generic name (such as

“course survey”) rather than the official instrument name so students can less easily search for the instrument online.

Avoid enforcing time limits: Although many RBAs have recommended time limits, placing time limits on the instruments themselves can increase students’ test anxiety and sense of higher stakes. Not placing strict time limits can also mediate technical difficulties students may face with online administration.

Do not share the solutions, answers, or students’ scores: This helps maintain the security of the RBA so the community can continue to use it. Providing scores can motivate students to want to know the solutions to the problems. The scores themselves are likely difficult for students to interpret. For example, pre-scores are typically quite low (in some cases post-scores as well), which could demoralize students without the appropriate context. Furthermore, RBA scores are only informative about group-level scores, not individual students, making individual scores less useful.

B. Sample script

Suggested script for an in-class or email announcement:

Pre-test: You will receive emails from me with links to different pre-test surveys (a “concepts” survey and a “nature of physics” survey), which are part of your first homework assignment. We ask you to answer these pre-test questions to give us a better idea of your understanding of physics before the class begins. We use your responses to the survey to tailor our instruction in the course - not to evaluate you. If you are unsure about your answers, do not worry - this is useful information for us. Please try your best to answer the questions without help from any textbooks or anyone else. You will receive full credit (equal to one-half of a homework assignment) just for answering all the questions, right or wrong. Please complete the two pre-tests by ...

Post-test: You will receive emails from me with links to different post-test surveys (a “concepts” survey and a “nature of physics” survey), which are part of your last homework assignment. As with the surveys at the start of the course, we use your responses to the post-survey to evaluate our instruction in the course - not to evaluate you. If you are unsure about your answers, do not worry - this is useful information for us. Please try your best to answer the questions without help from any textbooks or anyone else and use the survey as an opportunity to test your own understanding to help guide your studying for the final exam. You will receive full credit (equal to one-half of a homework assignment) just for answering all the questions, right or wrong. Please complete the two post-tests by ...

[1] Adrian Madsen, Sarah B. McKagan, and Eleanor C. Sayre, “Best Practices for Administering Concept Inventories,”

- [2] Jayson M Nissen, Manher Jariwala, Eleanor W Close, and Ben Van Dusen, "Participation and performance on paper-and computer-based low-stakes assessments," *International Journal of STEM Education* **5**, 21 (2018).