Findings Brief Appendix

MATCHING DASHBOARD OUTPUT

Matching attempts to group students (or the individuals you are trying to impact) with similar characteristics. The Coach finds the matches that yield the lowest net discrepancy between users and non-users. In other words, it takes the absolute value of the differences between user and non-user pre-test scores in different combinations until it finds the lowest value. To learn more about how the Coach conducts matching, refer to the Matching Technical Appendix.

That Matching Dashboard will:

- Determine the number of observations in the intervention and comparison groups
- Generate a table of background statistics for users and non-users (Table 1)
- Report how similar the groups of users and non-users are after matching (Figure 1)

> **NOTE:** Output from the Matching Dashboard populates the "Setting and Sample" section of your Findings Brief.

Table 1. *Background Characteristics of Students in the Evaluation Sample*

Characteristic	Full Sample	Users	Non-users	Difference
2014 Benchmark Score (Pre-test)	214.2	212.8	216.4	-3.6
Percent Female	51.3	50.9	51.9	-1
Number of Students	240	140	100	--
Number of Schools	12	7	5	--

Table 1 above summarizes key characteristics of your sample. If any of the characteristics have a large value in the "Difference" column, those are characteristics in which differences between users and non-users remain after matching. Differences at baseline on important measures (like a baseline test) mean you should interpret the differences in outcomes with caution – they may be caused in part by pre-existing differences between users and non-users.

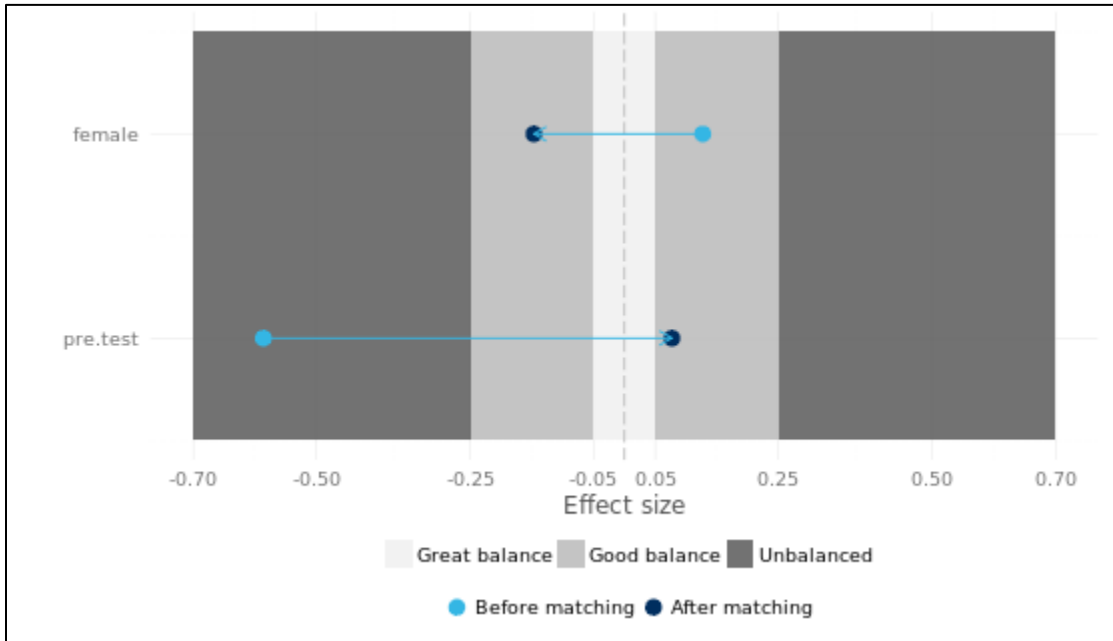**Figure 1.** *Similarity (Balance) of Users and Non-Users in Matched Sample*

Figure 1 above indicates whether the sample created by matching contains users and non-users of the educational technology that are equivalent on important measures, at baseline (before the study period). If your sample has good baseline equivalency, or balance, then you can be more confident that differences in the outcome you're studying are caused by the educational technology you're testing.

IMPACT ESTIMATION DASHBOARD OUTPUT

Once the data is loaded, and the other inputs are specified, the RCE Coach calculates the probability that the effect of an educational technology is above or below a threshold selected by the user (in Figure 2, the threshold, as indicated by the vertical line, is 0.25). This is the probability that the educational technology is moving the needle. Figure 2 illustrates this calculation.

Figure 2. *Posterior distribution of the effect of the educational technology on the outcome*
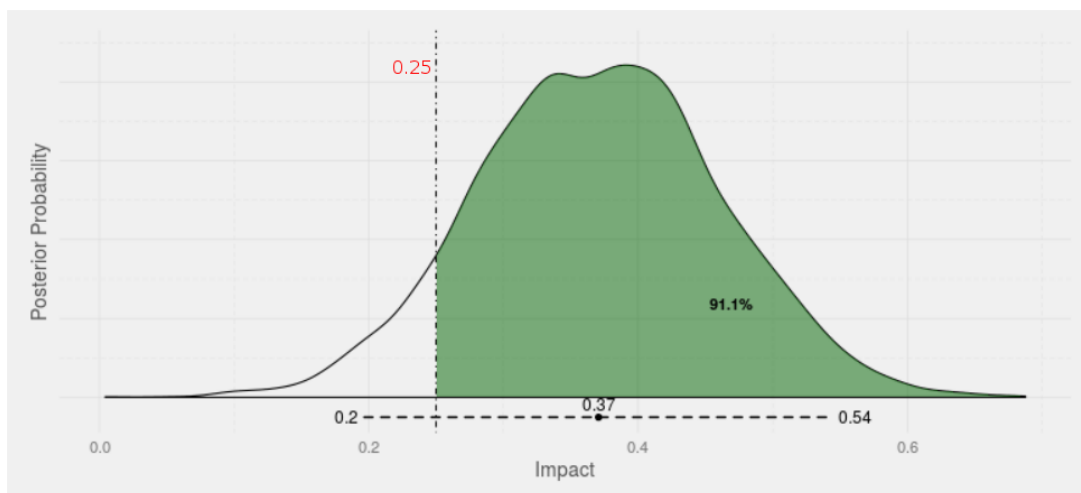
This figure tells us that:

☐ There is a 91.1% probability that the intervention increases the outcome by 0.25 units or more.

☐ There is a 95% probability that the true impact of the intervention is between 0.20 and 0.54 units.

> This is the "credible interval"

☐ The point estimate (e.g., our best guess) of the effect of the educational technology on the outcome is 0.37. This number is calculated as the mean of the posterior distribution.

> **NOTE:** Output from the Impact Estimation Dashboard populates the "Answers" and "Evaluation Design" sections of your Findings Brief.

To learn more about how the Coach estimates your technology's effect, refer to the Impact Estimation Technical Appendix.

NOTES

☐ This analysis was performed using a matched comparison design. Several assumptions were made to simplify the user's choices. The Matching Technical Appendix explains these assumptions in more detail.

☐ This analysis was performed using a Bayesian approach, rather than a frequentist approach. Because frequentist approaches are commonly used by educational researchers, we provide results from a frequentist analysis of the same data in Table 2 below. For more information on the Bayesian statistical analysis, refer to the Impact Estimation Technical Appendix.

☐ This analysis was performed using the beta version ## of the RCE Coach. Please share your feedback here!

☐ All the code for the RCE Coach is open-source under the GPL-V3 license, and available on our github repository: https://github.com/mathematica-mpr/MPRDashboards

Table 2. *Impact Results Obtained Using a Frequentist Approach*

Outcome	Impact Estimate (Effect size)	Standard Error	p-value
2015 Benchmark Score	0.08	0.04	0.048