

Supplemental Material

CBE—Life Sciences Education

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Appendix A

Key Rasch Terms

Logit: The logit (a term which is used for log odds units) is the measurement unit in Rasch measurement.

Wright Map: A technique of displaying Rasch person measure and item measure data. As person measures and item measures are expressed with the same logit scale, it is possible to plot both person measures and item measures on a single plot. A Wright Map allows a researcher to evaluate the spread of items, the location of respondents with respect to the test items, and explain the performance of test takers using the set of test items to explain what skills a test taker does and does not have.

Person Fit: In a Rasch analysis person fit is used to investigate the degree to which a person's answers to items match what is expected from the Rasch measurement model.

Item Fit: In a Rasch analysis item fit is used to investigate the degree to which respondent's answers to a specific test item match what is expected from the Rasch measurement model.

Rasch Model: The model developed by Georg Rasch. The model makes use of probabilities. Of importance is the model (for a right/wrong test) considers the difficulty of test items and the ability of persons.

Anchor Item: Such items are those which are used to link one test form to another test form. By having common test items across forms it is possible to link the scale of one test form to another test form.

Appendix B

A Potential Rasch Test Development and Analysis Road Map (Simplified for Beginners)

Conceptualize your variable.

Write test items to define different parts of your variable.

Compare your predictions of item difficulty along the variable with predictions of other experts.

For items- when predictions of test developer and experts match, retain those items.

For items- when predictions of test developer and experts do not match, then revise or remove such items.

Collect data using a set of test items.

Conduct a Rasch analysis using a software program such as Winsteps (Linacre, 2016).

Evaluate item fit. Possibly remove misfitting items from an analysis.

Evaluate person fit. Try to figure out why some persons misfit.

Evaluate item error and evaluate person error.

Evaluate your Wright Map. Do items mark the range of the variable? Where do respondents fall on the variable? Are there enough items to distinguish test takers ability?

At the end of your analysis, compute person measures (in logits) and item measures (in logits). Use these logit values for statistical analysis of your data.