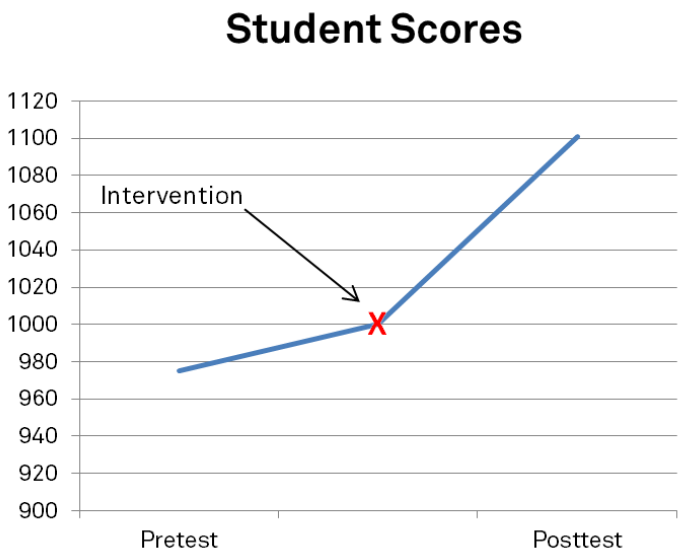
cla+ cwra+

Guide for Using CLA+/CWRA+ in Efficacy Studies

INTRODUCTION

This guide is intended for schools who wish to use their CLA+/CWRA+ data to conduct efficacy studies. An efficacy study investigates the effect of an intervention (e.g. a curriculum or course) in ideal, controlled circumstances. Oftentimes, efficacy studies will compare two or more groups that are equal on all variables other than the intervention being implemented. The graph below shows an example efficacy study design.



To best make use of this guide, think about which questions you would like to answer about your students. This guide will provide ideas for different study designs depending on these questions. By reading this guide, you will gain insight into:

- When to test your students
- Which students you should test
- How often to test your students
- How to analyze your data
- The advantages and disadvantages of different study designs

GENERAL TIPS:

- Larger samples are always better than smaller samples, particularly if you will be testing longitudinally (i.e. testing the same students over a period of time).
- Try to randomly select participating students. This is the best way to gather a sample that reflects the greater student body in terms of field of study, ethnicity, gender, parent education, academic performance, and any other potentially relevant characteristics. If random sampling is not possible, other methods such as stratified (e.g., classroom) sampling is also a possibility.
- In addition to using CLA+/CWRA+ data, consider collecting data on other variables. This enables you to learn about other factors that contribute to student growth and potentially interact with school or program effects.

FOR EVALUATING AT THE SCHOOL-WIDE LEVEL:

How have scores changed since implementing our new, campus-wide initiative?

One-Group Pretest-Posttest Design

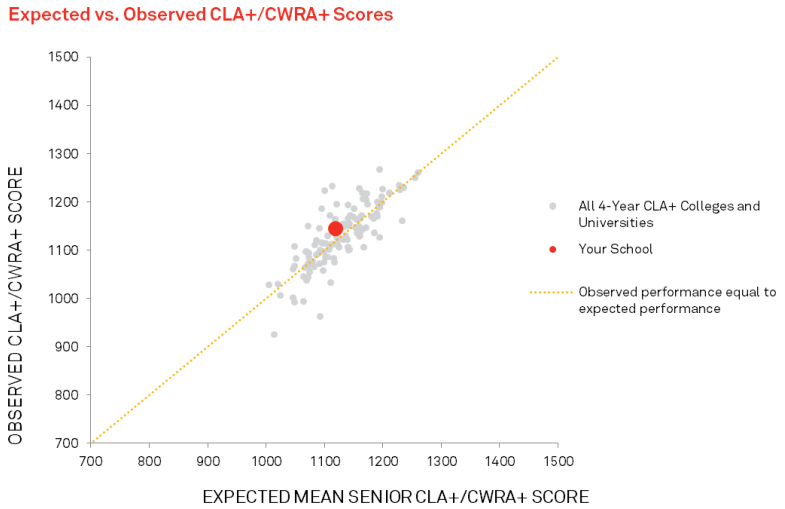
NOTE: This design works best for schools that have been collecting CLA+/CWRA+ data prior to the implementation of the new initiative. It may also work well for schools that are planning to implement a new initiative in the future, but not within the current or upcoming school year.

- Prior to implementation, administer the CLA+/CWRA+ either to all students or a representative sample of the student body. For this type of study, it is important to test non-entering students, particularly before the implementation of the new initiative.
- After implementation of the program, administer the CLA+/CWRA+ again to the same cohort of students. In your analysis, compare results from the administration prior to implementation of the program to results from after implementation.
- If testing multiple grade levels, you may wish to compare effect sizes between years (e.g. freshman-to-sophomore effect size in the administration prior to implementation versus in the administration after implementation).

How do our exiting students perform relative to their expected performance?

CLA+/CWRA+ Cross-sectional Model

- Administer the CLA+/CWRA+ to entering students in the fall and exiting students in the spring.
- In your analysis, focus on the Value Added estimate provided in your institutional report. The Value Added estimate provides a comparison of how much higher your seniors performed relative to their expected performance, as determined by a number of factors.
- To contextualize your Value Added estimate, you can compare it with scores from other schools as summarized in our National Summary Reports. Furthermore, you will be able to select a sample of similar schools with which to compare your Value Added score on our upcoming Data Miner platform. Our national summary report and the institutional report provided each spring contain graphs that show how your school performed relative to others. For instance, the scatter plot below illustrates this effect.
    - You can also use this method to compare your overall scores with other schools' scores.



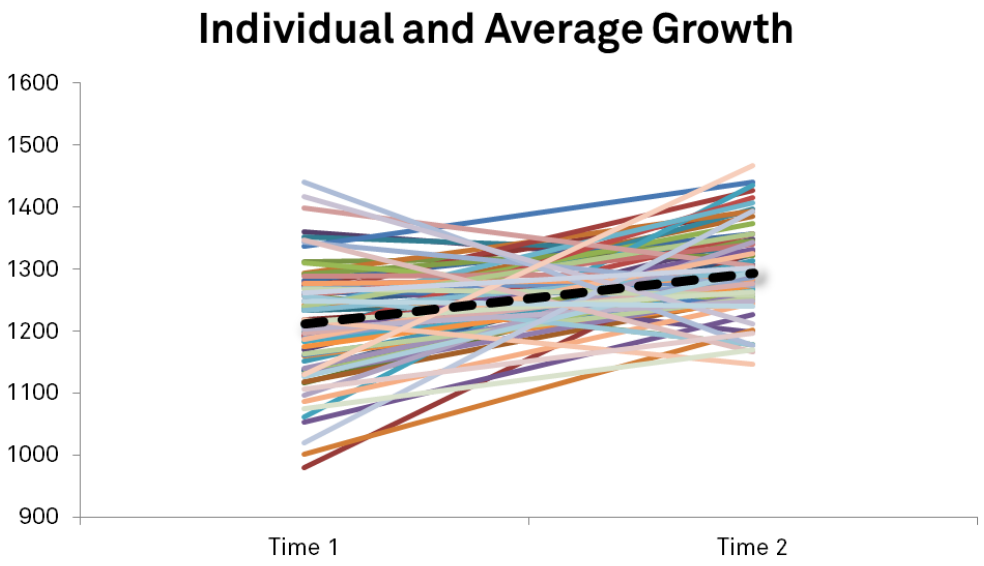
How much growth do our students show over time?

CLA+/CWRA+ Longitudinal Model

- Administer the CLA+/CWRA+ to entering students in the beginning of the academic year. At the end of the academic year, administer the CLA+/CWRA+ to the same sample of students. Continue testing according to this model in subsequent years, following the original set of students in each administration. You may choose

to test students only at the beginning and end of their time at your school, or you may choose to also test at one to three intermediate administrations.

- Be sure to have a large enough sample size to account for attrition (i.e. losing participants over time). For example, if you begin with a sample of only 75 students and 50 of those students drop out or transfer to another institution, you will be left with a sample of only 25 students, which is not a large enough sample to draw any meaningful conclusions. CAE recommends testing at least 300 students in the initial administration if you choose to test by this model. A properly executed longitudinal design would give you information about the growth exhibited by each student, as well as average growth across all students. For instance, this graph shows that there is variation in growth among the students, as expected, although on average positive growth was shown, as evidenced by the increasing dashed black line.



- If you plan to test using the longitudinal model, it is very important that you let your CAE representative know during the initial administration. This way, CAE can ensure that students will have the same ID for each time they test, making them much easier for you to track. Additionally, your representative can provide you with resources on how to run statistical analyses on your longitudinal data.

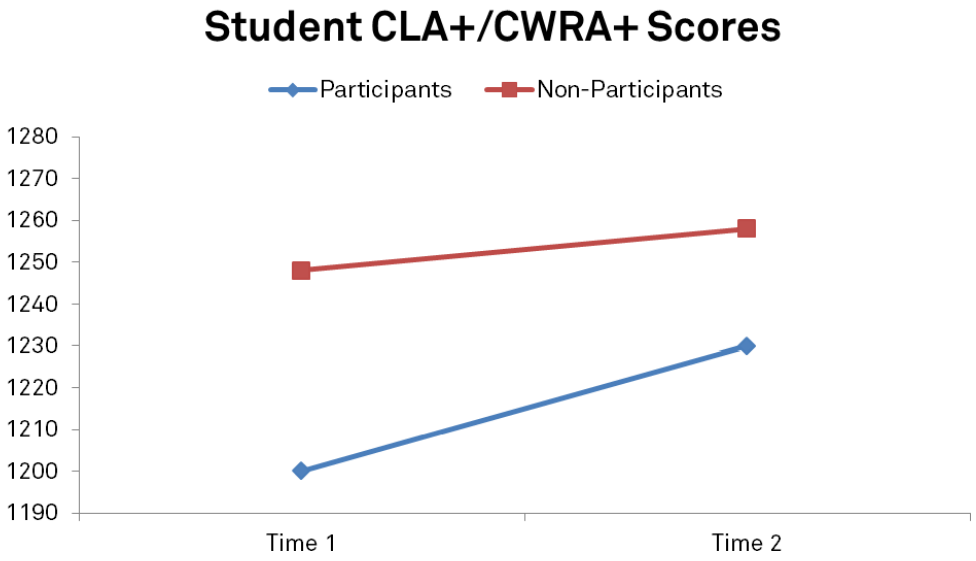
FOR EVALUATING SPECIFIC PROGRAMS OR COURSES:

Is our program causing student growth?

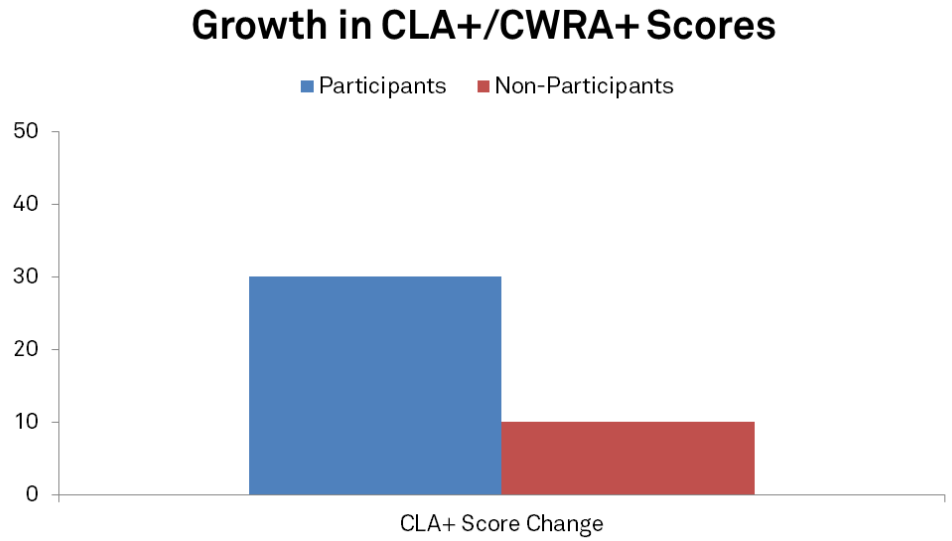
Nonequivalent Control Group Design

- Administer the CLA+/CWRA+ to students at the beginning of the program. The sample should include BOTH students who will be participating in the program and students who will not be participating. At the end of the program, administer the CLA+/CWRA+ to this same sample of students.
- In an ideal situation, students being tested would have an equal likelihood of being in the participant group versus the non-participant group. For example, half the student body, chosen at random, might be selected to participate in the program. This method of sampling is called a random sample.
    - The benefit of a random sample is that you can be more certain that any differences between groups are a direct result of program participation. However, it is oftentimes not feasible to obtain a random sample.
    - An alternative to a random sample is a matched sample, in which each student has a "match" in the other group based on similarity in characteristics like gender, ethnicity, etc.
    - If you cannot obtain a random sample or a matched sample but still wish to draw meaningful inferences from this type of study, let your CAE representative know. We may be able to conduct a study using sophisticated statistical methods that correct for non-randomness.
- When analyzing results, focus on comparing the participants versus non-participants based on their growth, rather than solely on their final score.

- Take, for instance, the students in the example graph below. If a school were to only focus on the difference in scores at the end of the program, it would appear that the program was not effective, because non-participants scored higher on average than did participants. However, when considering the students' scores at the outset of the program, it becomes clear that students who participated showed more growth than students who did not.



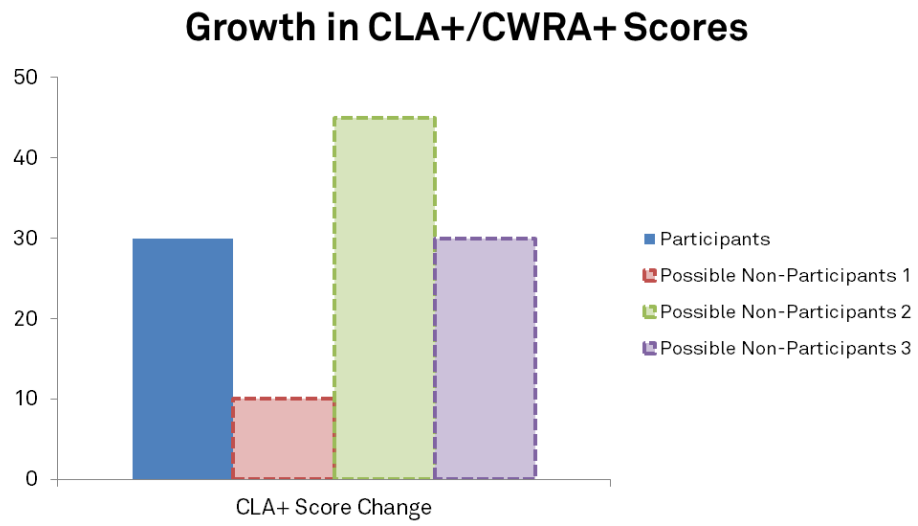
- It may seem logical to only test students who participate in the program and then compare their pretest and posttest scores. This is a viable option if it is not feasible to recruit students who are not participating in the program. However, your findings will be stronger if you compare participants with non-participants. This is because some degree of growth is expected across time regardless. In the previous example, you can see that non-participants showed some growth, albeit to a lesser extent than participants. This implies that the amount of growth shown by participants was only partially attributable to program participation. Even if they had not participated, they likely would have shown some growth. The above graph would translate into the following direct comparison of growth, which clearly shows the positive effect of the program.



Are students in the program showing growth?

One-Group Pretest-Posttest Design

- This design is similar to the nonequivalent control groups design, but does not have a control group, which is the comparison group who does not receive the treatment/intervention. Thus, you should use this design only when all of your students are participating in the new initiative or program.
- Administer the CLA+/CWRA+ to program participants before the start of the program and at the end of the program. If the program covers an extended time period, you may also wish to test students at one or more intermediate points during the program.
- In your analysis, examine the difference between scores at the first administration and last administration, respectively.
- Since there is no comparison group, you will not be able to tell whether or not any student growth that occurs results from participation in the program or from other factors. Additionally, as the following graph shows, it is possible that students who did not participate in the program showed a similar amount of growth or even more growth, so it is difficult to know how to contextualize any observed growth in the program participants. Finally, it is also possible that the students who did participate in the program would have shown at least some growth over time had they not participated in the program. Nevertheless, this design is useful for demonstrating preliminary evidence of program effectiveness where it is not feasible to obtain a comparison group.



How do program participants fare compared to non-participants?

Posttest-Only Design with Nonequivalent Groups

- Administer the CLA+/CWRA+ to students at the end of the program. The sample should include both students who participated and students who did not participate. Ideally, the students who did not participate should be as similar as possible to those who did on relevant characteristics (e.g. demographics, field of study).
- If available, use data that would have been collected before the program (such as standardized test scores) to determine how each group performed compared to their expected performance given the baseline data. The more data you have from before the program began, the closer you can come to the nonequivalent groups design described above.
- A limitation to this design is that it is not possible to track growth. However, it does allow for comparison between program participants and non-participants. Still important to remember is that, even in a matched sample, there may be underlying differences between groups that were not controlled for. It is possible that the difference between groups in their outcome may be due to these underlying differences rather than program participation itself.

How do program participants compare to students who have not yet participated?

Cross-sectional Design with Nonequivalent Groups

- Administer the CLA+/CWRA+ to entering students who have not yet participated in the program and exiting students who have participated.
    - Optionally, you may also wish to test exiting students who did not participate as another comparison group.
- In your analysis, compare the exiting students with the entering students. If also collecting data from non-participants at the same class level as the participants, you may compare their scores with entering students' scores as well.
- While this design does not allow for tracking real growth, it does allow for a reference point against which to compare senior scores without requiring the time commitment of a longitudinal design.