

COURSE VALIDATION STUDY

Target Course: BIOL 204
Prerequisite: BIOL 201 & BIOL 202

The following is statistical data on the validation of the following course prerequisite:
Successful completion of BIOL 201 and BIOL 202 as a prerequisite for BIOL 204.

BIOL 204 SUCCESS * Completed Prerequisites Crosstabulation

Count

		Completed Prerequisites		Total
		0	1	
SUCCESS	0	189	22	211
	1	437	377	814
Total		626	399	1025

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	90.778(b)	1	.000		
Continuity Correction(a)	89.275	1	.000		
Likelihood Ratio	105.145	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	90.690	1	.000		
N of Valid Cases	1025				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 82.14.

Chi-Square Measurement:

The *Chi-Square* measurement tests the hypothesis (*null hypothesis*) that there is “*no difference*” between the two groups. In order to reject this hypothesis and conclude that there is a statistically significant difference between the two groups Chi-Square must be greater than **3.84**. To ensure the validity of the Chi-Square test there is a minimum frequency threshold for a 2x2 table that should be obeyed. If any of the observed frequencies in the cross-tabulation table are **5 or below** than the validity of the Chi-Square measurement is questionable.

CHI-SQUARE = 90.77

REJECT NULL HYPOTHESIS

Fisher's Exact Measurement:

The *Fisher's Exact* measurement can be used as an alternative to the Chi-Square measurement where a large sample is difficult to obtain. In order to reject the null hypothesis and conclude that there is a statistically significant difference between the two groups Fisher's Exact must have a P-value **less than** the standard **.05**.

FISHER'S EXACT = .000

REJECT NULL HYPOTHESIS

Ratio:

The ratio to be measured is the ratio of *right response:wrong response*.

A *right response* would be nonsuccess in the prerequisite course combined with nonsuccess in the target course or success in the prerequisite course combined with success in the target course. A *wrong response* would be nonsuccess in the prerequisite course combined with success in the target course or success in the prerequisite course combined with nonsuccess in the target course. For the *study ratio* to meet the *ratio criteria* it must be greater than or equal to **2:1**.

RATIO: $189+377:437+22 = 566:459$ FAILED CRITERIA

Percent increase:

Percent increase is measured by subtracting the percent success before adjusting for the prerequisite from the percent success after adjusting for the prerequisite. For the *study percent increase* to meet the *percent increase criteria* there must be a difference greater than or equal to **10%** in the positive direction.

PERCENT INCREASE: PASSED CRITERIA

$814/1025 = 79\%$ Before Prerequisite

$377/399 = 94\%$ After Prerequisite

Summary

A total sample of 100, with at least 20 students in the non-successful group for the target course is recommended. In this case the total sample is sufficient (1025) and the number in the non-successful group is above the recommended level (211). Both the chi-square test and the Fishers Exact test reject the null hypothesis that success in BIOL 201 and BIOL 202 is independent of success in BIOL 204, showing that there is statistical evidence that BIOL 201 and BIOL 202 are necessary for success in BIOL 204. BIOL 201 and BIOL 202 also fail the Ratio criteria but pass the Percent Increase criteria. At this time there is sufficient statistical evidence that BIOL 201 and BIOL 202 are suitable as prerequisites for BIOL 204.