COURSE VALIDATION STUDY

Target Course: ASTR 101: Astronomy
Prerequisite: MATH 102

The following is statistical data on the validation of the following course prerequisite: Successful completion of MATH 102 as a prerequisite for ASTR 101.

ASTR 101 Success * Completed MATH 102 Crosstabulation

Count

		Complete MATH 102		Total
		0	1	
ASTR 101 Success	0	841	70	911
	1	1363	257	1620
Total		2204	327	2531

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	34.682(b)	1	.000		
Continuity Correction(a)	33.959	1	.000		
Likelihood Ratio	37.221	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	34.669	1	.000		
N of Valid Cases	2531				

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 117.70.

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 = 34.682 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: 841+257:1363+70 = **1098:1433** 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
1620/2531 = **64.0%** Before Prerequisite
257/327 = **78.6%** 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 (2,531). Additionally, the number in the non-successful group is above the recommended level (911). Both the chi-square test and the Fisher's Exact test reject the null hypothesis that success in ASTR 101 is independent of success in MATH 102, showing that there is statistical evidence that MATH 102 is necessary for success in ASTR 101. MATH 102 also passes the Percent Increase criteria. MATH 102 did not pass the Ratio criteria, however, this could be because an overwhelming number of students do not take MATH 102 as an advisory. At this time there is statistical evidence that MATH 102 is suitable as a prerequisite for ASTR 101.