

# COURSE VALIDATION STUDY

Target Course: CFE 105 Discovery-Based Education for Children  
Prerequisite: ENGL 101

The following is statistical data on the validation of the following course prerequisite:  
Successful completion of ENGL 101 as a prerequisite for CFE 105.

## CFE105 Success Recode \* ENGL101 Success Recode Crosstabulation

Count

		ENGL101 Success		Total
		NO	YES	
CFE105 Success	NO	21	1	22
	YES	29	5	34
Total		50	6	56

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.441(b)	1	.230		
Continuity Correction(a)	.575	1	.448		
Likelihood Ratio	1.605	1	.205		
Fisher's Exact Test				.386	.230
Linear-by-Linear Association	1.416	1	.234		
N of Valid Cases	56				

a Computed only for a 2x2 table

b 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.36.

### 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 = 1.441

FAIL TO 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 = .386

FAIL TO 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:  $21+5:29+1 = 26:30$  or **13:15**      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:      CRITERIA PASSED  
 $34/56 = 61\%$  Before Prerequisite  
 $5/6 = 83\%$  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 insufficient (56), but the number in the non-successful group is above the recommended level (22). Both the chi-square test and the Fishers Exact test fail to reject the null hypothesis that success in ENGL 101 is independent of success in CFE 105, showing that there is no statistical evidence that ENGL 101 is necessary for success in CFE 105. ENGL 101 also fails the Ratio criteria. ENGL 101 does pass the Percent Increase Criteria by increasing greater than 10% in the After Prerequisite group. At this time there is no statistical evidence that ENGL 101 is suitable as a prerequisite for CFE 105. A new analysis with additional data is recommended at a later date to increase the sample size.