

# Multiple Measure Assessment Project (MMAP) for ESL at Sacramento City College – Spring 2018

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In Fall 2016, at the request of the ESL Department, the Research Office at Sacramento City College (SCC) carried out a pilot study of possible multiple measures items for ESL as part of the Multiple Measures Assessment Project (MMAP). The 2016 study uses a set of survey items and methodology suggested by the American River College (ARC) Common Assessment Implementation team. In Spring 2018, the Research Office re-conducted the study at the request of the ESL Department, with a revised set of survey items based on the ESL faculty recommendations and the results from the pilot study. This report starts with a description of the survey design and sample. The second section describes the methodology employed in the analysis, followed by a discussion of the results and some concluding remarks.

## Survey design and sample

The 2016 study used a multivariate logistic regression model to examine the factors affecting ESL course success. In the model, the dependent variable is ESL course success (yes/no) and the independent variables are (1) U.S. high school GPA, (2) frequency of English usage (speaking), (2) highest level of education, (3) number of languages spoken, (4) years in the US, and (5) years studying English. The 2016 study examines student course success in one pooled sample. Without controlling for course levels, the model uses students' background characteristics to predict outcomes as if there is only one course level. Furthermore, as mentioned in the 2016 study, it measures background characteristics at the time of the survey rather than prior to placement assessment. Based on 382 observations, the study finds that students who had spent more years in the US and more years studying English, would have higher odds of success in ESL courses. The relationship between high school GPA and ESL course success was not statistically significant, which might have been due to small sample size (only 73 observations).

The Spring 2018 survey adapts the questions from the 2016 survey with revisions as follows (see Appendix A for the Spring 2018 survey form):

- We removed the question item on number of languages spoken because the 2016 pilot study did not find a statistically significant relationship between the number of languages students speak and ESL course success.
- We revised the question item on years studying English into English levels *before* taking ESL courses at SCC (Question 3). This is because we wanted to measure students'

characteristics *prior* to taking placement assessment, as suggested in the “Multiple Measures Model for ARC (LRCCD) ESL Students”.

- Question item on highest level of education: We used multiple yes/no questions on whether students had finished high school, college/university in the US, or in another country (Question 4-7). We then calculated the highest level of education based on students’ answers to these yes/no questions. We used the yes/no questions to avoid confusion among students as we expected that there would be a wide variation in students’ English comprehension and interpretation of the phrase “highest level of education”.
- We added two question items, one on how students met the prerequisites for the current course (Question 1) and the other on the number of ESL courses students had taken at SCC prior to the current course (Question 2). These two question items are used to identify students who were taking their first ESL course at SCC in Spring 2018.
- At the request of the ESL Department, we also added a question on whether students had taken English courses at an adult education program in the US before attending SCC (Question 10).

The survey was administered in all ESL course sessions at all levels in mid-Spring 2018.<sup>1</sup> We categorized course levels by levels below transfer using the CB21 codes.

Table 1 summarizes the survey sample.

Table 1. Survey sample

ESL course levels	Number of sessions surveyed	Number of students with survey form returned	Percent in sample
Three levels below	9	182	16.3%
Two levels below	10	237	21.2%
One levels below	14	304	27.2%
Transfer level	18	393	35.2%
<b>Total</b>	<b>51</b>	<b>1116</b>	<b>100%</b>

## Methodology

As part of the efforts to develop a multiple measures model for ESL at SCC, the study seeks to identify students’ characteristics that can be predictive factors in students’ success in different levels of ESL courses. Because it is impossible to study students before they enter ESL courses at SCC, we surveyed all ESL students in Spring 2018. We were able to collect data on 1,116 ESL students in the four levels of ESL courses. However, the inclusion of students who had previously taken ESL courses at SCC in the analysis would be problematic, as we do not know to what extent their ESL course levels were affected by their characteristics or by their prior ESL learning at SCC. Therefore, we only included students who were taking their first ESL course at SCC in Spring 2018, i.e. those who said they met the prerequisites for the ESL course through

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<sup>1</sup> A pilot survey was sent out to 5 sessions in the four levels prior to final survey administration. These are also included in the final dataset for analysis.

the assessment process (Question 1 in survey form) or indicated that it was their first ESL course at SCC (Question 2). This resulted in a subset of 567 students. Of the 567 students who said they were taking their first ESL course in Spring 2018, 478 completed the course successfully. Table 2 summarizes the sample subset in Spring 2018 and success rates by ESL course level.

Table 2. Subset of students taking their first ESL course at SCC in Spring 2018 and their success rates

ESL course levels	Number of students in sample subset	Percent in sample subset	Success count	Success rates
Three levels below	172	30.3%	149	87%
Two levels below	125	22.0%	106	85%
One levels below	168	29.6%	141	84%
Transfer level	102	18.0%	82	80%
<b>Total</b>	<b>567</b>	<b>100%</b>	<b>478</b>	<b>84%</b>

As shown in Table 2 above, the success rate in each of the ESL course levels is relatively high.<sup>2</sup> In other words, students in the sample subset are highly likely to succeed in their Spring 2018 ESL course levels. The relatively high likelihood of success of the students in the sample subset offers a unique opportunity for our analysis—it accommodates the analysis of predictive factors in students’ placement into course levels in which they are highly likely to succeed.

We will employ the multivariate regression method in our analysis.<sup>3</sup> Our outcome variable, or dependent variable, is ESL course level. Our independent variables include (1) English level before taking ESL at SCC, (2) education level, (3) frequency of out-of-classroom English usage, (4) years living in the US, and (5) taken English courses in an adult education program. Table 3 describes our variable attributes. (See Appendix B for bivariate results.)

Table 3. Variable attributes

Variable	Type	Attribute
<i>Dependent variable</i>		
Course level	Ordinal	3 = Transfer level 2 = One level below 1 = Two level below 0 = Three level below
<i>Independent variable</i>		
(1) English level before taking ESL at SCC	Ordinal	5 = Advanced 4 = Upper-intermediate 3 = Intermediate 2 = Pre-intermediate 1 = Beginning or Elementary 0 = Don’t know/Don’t understand
(2) Education level	Ordinal	2 = Finished college/university 1 = Finished high school 0 = Didn’t finish high school

<sup>2</sup> SCC overall success rate is about 68% (Fall 2017 data).

<sup>3</sup> Ordinal logistic regression

Variable	Type	Attribute
(3) Frequency of out-of-classroom English usage	Ordinal	3 = Always 2 = Usually 1 = Sometimes 0 = Rarely or never
(4) Years living in the US	Continuous	
(5) Taken English courses in an adult education program	Ordinal	3 = 5 or more courses 2 = 3-4 courses 1 = 1-2 courses 0 = Didn't take

## Results and discussions

Table 4 below presents the results for the ordinal logistic regression. The coefficient estimates are statistically significant for (1) English level before taking ESL and (2) Education level but not significant for the other three independent variables. With each increment of students' self-reported English level before taking ESL at SCC, the odds of being in a higher ESL course level would be expected to increase by approximately 60 percent. A unit increase in students' self-reported highest education level would be expected to double the odds of being in a higher-level ESL course (more than a 100 percent increase in the odds).

Table 4. Ordinal Logistic Regression Results

Dependent variable: Course level	
Independent variables	Coefficient estimates (odds ratio) <sup>4</sup>
(1) English level before taking ESL	1.588***
(2) Education level	2.023***
(3) Frequency of out-of-classroom English usage	1.093
(4) Years living in the US	1.023
(5) Taken English courses in an adult education program	0.803
<i>Number of observations</i>	<i>567</i>
<i>Intercepts</i>	
Three levels below   Two levels below	0.868**
Two levels below   One level below	1.920***
One level below   Transfer level	3.550***
<i>AIC</i> <sup>5</sup>	<i>1374.589</i>

Significance codes: 0 '\*\*\*' 0.005 '\*\*'

Coefficient estimates were exponentially transformed to represent odds ratios.

<sup>4</sup> An odds ratio of 1 is the baseline for interpretation. When the odds ratio equals to 1, it would be expected that there is no association between the dependent and independent variable. The strength of association is higher when the odds ratio is farther from either side of 1. In order to express odds ratio as the percentage increase or decrease in the odds for being in a higher course level, subtract the odds ratio by 1 and multiply the result by 100. A negative number indicates a decrease and a positive number indicates an increase in the odds. Eg:  $(1.588 - 1) * 100 = 58.8$  (approximately 60 percent increase in odds of being in a higher ESL course level).

<sup>5</sup> AIC (Akaike Information Criterion) is a measure for relative goodness of fit. It is used to compare between models—a model with a smaller AIC value indicates a better fit to the data. When we run the model only including independent variables (1) and (2) while excluding (3), (4), and (5), the AIC value is 1409.395. This value is higher than the value in the full model, indicating that the full model is a better fit. That is why we decided to keep all the variables in the model.

The results indicate that factors such as students' frequency of speaking English outside the classroom, years living in the US, or having taken ESL courses in adult education programs are not predictive of students' ESL course level. However, when we ran the same model on the sample inclusive of all ESL students (both taking first ESL course at SCC and having taken more than one ESL course at SCC), we found empirical evidence that years living in the US can be predictive of students' ESL course level, though marginally. With each year staying in the US, students would be expected to have the odds of being in a higher ESL course increased by about 7 percent (odds ratio = 1.071,  $p = .000$ ). This result suggests that the length of stay in the US per se would not necessarily increase the odds of being in a higher ESL course level. However, being in the US and taking ESL courses at the college might improve the odds. Note that having taken adult education ESL courses does not seem to improve the odds of being in a higher-level ESL course in either case. This might have been because ESL course levels in adult education are structured differently than those at a community college. Another possibility might have been that the survey question only asked for the number of adult education ESL courses rather than the specific course levels students had taken or completed before SCC ESL courses.

We did not include U.S. high school GPA in the model because we only have 62 observations for GPA. Nevertheless, when we ran the model with only GPA as the independent variable and ESL course level as the dependent variable, we found that, with each unit increase in GPA, the odds for a student to be in a higher ESL course level would be expected to increase by about 160 percent (odds ratio = 2.615,  $p = .028$ ).

To summarize, the study seeks to identify predictive factors in students' placement into ESL course levels in which they are highly likely to succeed. The study uses data collected on students' characteristics such as English levels before taking ESL at SCC, highest education levels, frequency of speaking English outside of the classroom, years living in the US, and U.S. high school GPA. Using the data on students who reported that they were taking their first ESL courses at SCC in Spring 2018, the study found empirical evidence for the association between students' ESL course levels and their self-reported English level prior to taking ESL at SCC, as well as their self-reported highest education level. Students with higher English levels prior to taking ESL at SCC or higher education levels would be expected to have higher odds of being in higher ESL course levels. We also found empirical evidence for the association between students' ESL course levels and their high school GPA, but the small number of observations limits our generalization of the result.

## APPENDIX A—SURVEY FORM

### ESL MMAP SURVEY

Spring 2018

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The results of this survey will be used for research purposes only and will assist the college in future efforts to correctly place students in appropriate courses. All information is confidential and will in no way affect your status or grade in this course. Thank you!

Please select your answer and fill in the blanks if applicable.

1. How did you meet the prerequisite requirements for this course?
  - a. I took the assessment test.
  - b. I took the previous course.  
What was the course (for example, ESL 40)? \_\_\_\_\_  
When did you take the course (for example, Fall 2017)? \_\_\_\_\_
  - c. Other.
  - d. I don't understand the question.
2. How many ESL courses did you take at Sacramento City College (SCC) before this course? \_\_\_\_\_ (write "0" if this is your first ESL course at SCC)
3. What was your English level **BEFORE** taking ESL course(s) at SCC?
  - a. Beginning or Elementary
  - b. Pre-intermediate
  - c. Intermediate
  - d. Upper-intermediate
  - e. Advanced
  - f. I don't know.
  - g. I don't understand the question.
4. Did you finish high school in another country? ☐ Yes ☐ No
5. Did you finish high school in the United States (the U.S.)? ☐ Yes ☐ No  
If yes, **what was your GPA** (grade point average) at the time you graduated? Write the number here: \_\_\_\_\_
6. Did you finish college or university in another country? ☐ Yes ☐ No
7. Did you finish college or university in the U.S.? ☐ Yes ☐ No
8. How often do you speak English outside of the classroom (for example, at home or at work)?
  - a. Always
  - b. Usually
  - c. Sometimes
  - d. Rarely or never
9. How long have you lived in the U.S.? \_\_\_\_\_ years.
10. Did you take English courses in an *adult education program* in the U.S. **BEFORE** attending SCC?
  - a. 1-2 courses
  - b. 3-4 courses
  - c. 5 or more courses
  - d. I did not take English courses in an adult education program in the U.S. before SCC.

## APPENDIX B—BIVARIATE RESULTS

<b>Below Transfer Level * 3. What was your English level before taking ESL course(s) at SCC? Crosstabulation</b>								
3. What was your English level before taking ESL course(s) at SCC?								
		Don't know/Don't Understand	Beginning/Elementary	Pre-intermediate	Intermediate	Upper-intermediate	Advanced	Total
Three Level Below	Count	41	95	14	13	3	3	169
	% within Below Transfer Level	24.3%	56.2%	8.3%	7.7%	1.8%	1.8%	100.0%
Two Level Below	Count	24	29	30	25	7	4	119
	% within Below Transfer Level	20.2%	24.4%	25.2%	21.0%	5.9%	3.4%	100.0%
One Level Below	Count	34	21	19	69	15	6	164
	% within Below Transfer Level	20.7%	12.8%	11.6%	42.1%	9.1%	3.7%	100.0%
Transfer Level	Count	15	12	13	34	14	10	98
	% within Below Transfer Level	15.3%	12.2%	13.3%	34.7%	14.3%	10.2%	100.0%
Total	Count	114	157	76	141	39	23	550
	% within Below Transfer Level	20.7%	28.5%	13.8%	25.6%	7.1%	4.2%	100.0%

Below Transfer Level * Education Level Crosstabulation						
			Education Level			
			Did not finish high school	High school	College/Unive rsity	Total
Below Transfer Level	Three Level Below	Count	12	134	26	172
		% within Below Transfer Level	7.0%	77.9%	15.1%	100.0%
	Two Level Below	Count	5	93	27	125
		% within Below Transfer Level	4.0%	74.4%	21.6%	100.0%
	One Level Below	Count	5	116	47	168
		% within Below Transfer Level	3.0%	69.0%	28.0%	100.0%
	Transfer Level	Count	0	57	45	102
		% within Below Transfer Level	0.0%	55.9%	44.1%	100.0%
Total		Count	22	400	145	567
		% within Below Transfer Level	3.9%	70.5%	25.6%	100.0%

Below Transfer Level * 8. How often do you speak English outside of the classroom? Crosstabulation							
			8. How often do you speak English outside of the classroom?				
			Rarely or never	Sometimes	Usually	Always	Total
Below Transfer Level	Three Level Below	Count	17	99	46	7	169
		% within Below Transfer Level	10.1%	58.6%	27.2%	4.1%	100.0%
	Two Level Below	Count	6	63	44	11	124
		% within Below Transfer Level	4.8%	50.8%	35.5%	8.9%	100.0%
	One Level Below	Count	9	82	57	20	168
		% within Below Transfer Level	5.4%	48.8%	33.9%	11.9%	100.0%
	Transfer Level	Count	9	40	40	13	102
		% within Below Transfer Level	8.8%	39.2%	39.2%	12.7%	100.0%
Total		Count	41	284	187	51	563
		% within Below Transfer Level	7.3%	50.4%	33.2%	9.1%	100.0%

Below Transfer Level * 10. Did you take English courses in an adult education program in the US before attending SCC?							
			10. Did you take English courses in an adult education program in the US before attending SCC?				
			Did not	1-2 courses	3-4 courses	5 or more courses	Total
Below Transfer Level	Three Level Below	Count	70	93	8	0	171
		% within Below Transfer Level	40.9%	54.4%	4.7%	0.0%	100.0%
	Two Level Below	Count	59	51	9	0	119
		% within Below Transfer Level	49.6%	42.9%	7.6%	0.0%	100.0%
	One Level Below	Count	84	70	9	2	165
		% within Below Transfer Level	50.9%	42.4%	5.5%	1.2%	100.0%
	Transfer Level	Count	59	38	3	0	100
		% within Below Transfer Level	59.0%	38.0%	3.0%	0.0%	100.0%
Total		Count	272	252	29	2	555
		% within Below Transfer Level	49.0%	45.4%	5.2%	0.4%	100.0%

9. How long have you lived in the US?				High school GPA		
	Mean	N	Std. Deviation	Mean	N	Std. Deviation
Below Transfer Level						
Three Level Below	3.696	170	5.422	2.975	12	.685
Two Level Below	3.494	125	5.516	2.688	8	.692
One Level Below	4.326	167	5.192	3.226	23	.382
Transfer Level	4.766	101	5.350	3.268	19	.513
Total	4.030	563	5.369	3.121	62	.557