



Correlations and Clues: How are ER and Student Success Interwoven?

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In our discussion of implementing Extensive Reading across all Freshman English courses at Feng Chia University, we work to establish a baseline for the empirical investigation of barriers to and facilitators of the success of the program, its teachers, and its students, using quantitative methodology to assess performance of a substantial number of participants. Our first analysis of the initial program implementation in 2018-2019 focuses on words read by top and bottom readers. It also identifies room for further investigation of reading proficiency by gender in college-based enrollments across the four levels.

Our primary purpose in this study is to see if a profile of student reading keyed to potential common characteristics in high and low readers could be established for entering Freshmen at Feng Chia University. Our goal is to apply such a profile to help set up our students for greater success.

Feng Chia University is a private science, technology and business university of roughly 20,000 undergraduate and graduate students in central Taiwan. All entering students in each of the eight Colleges are required to take a full year (two semesters) of Freshman English. Typically, student scores on the English portion of Taiwan's Joint College Entrance Examination will determine their placement into one of four levels, as shown in Figure 1. That score is a part of the Subject Ability Exam, which includes English and is taken by students either in senior year in high school or the summer before coming to the university. There are several additional ways to gain

admission to universities, including alternate testing procedures, as outlined by the College Entrance Examination Center (<https://www.ceec.edu.tw/>). At Feng Chia, the Admissions Division handles the placements.

Entering students responding to a university-wide survey of their demographics reported their placements as illustrated in Table 1.

Table 1: Number of Entering Students in Each Level

Class Level of Entering Students	Total Student Placement	%
Freshman English, Level 1	640	18
Freshman English, Level 2	1570	42
Freshman English, Level 3	1253	34
Freshman English, Level 4	259	6
Total	3722	100

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Extensive Reading (ER) at Feng Chia has been a part of some sections since 2006; the online Freshman English Student Manual

(Lambert et al., 2015) notes that ER has also been used consistently for independent self-directed study of advanced students as an alternative to the regular two-hour weekly class. The initial implementation in 2018-2019 required students in all Freshman English classes to complete a certain amount of ER (counted as words read) outside of class meetings, although orientation to the program and a range of listening and reading-cued activities were typically incorporated in classes. After reading their choice of an ER book, 5,000 of which are located in a special open section of the Library, students accessed brief

online comprehension quizzes using the M-Reader website (mreader.org). Students' scores on the quizzes were recorded; for each quiz receiving a pass, M-Reader awarded them the number of words for that book and kept a running tabulation for individual students. Generally, students attempted a book a week. The ER participation counted 20% of the year's grade.

In 2018-2019, Feng Chia's Foreign Language Center offered 121 Freshman English sections; class sizes range between 30 and 40 students, who are enrolled in all eight Colleges, as shown in Figure 1.

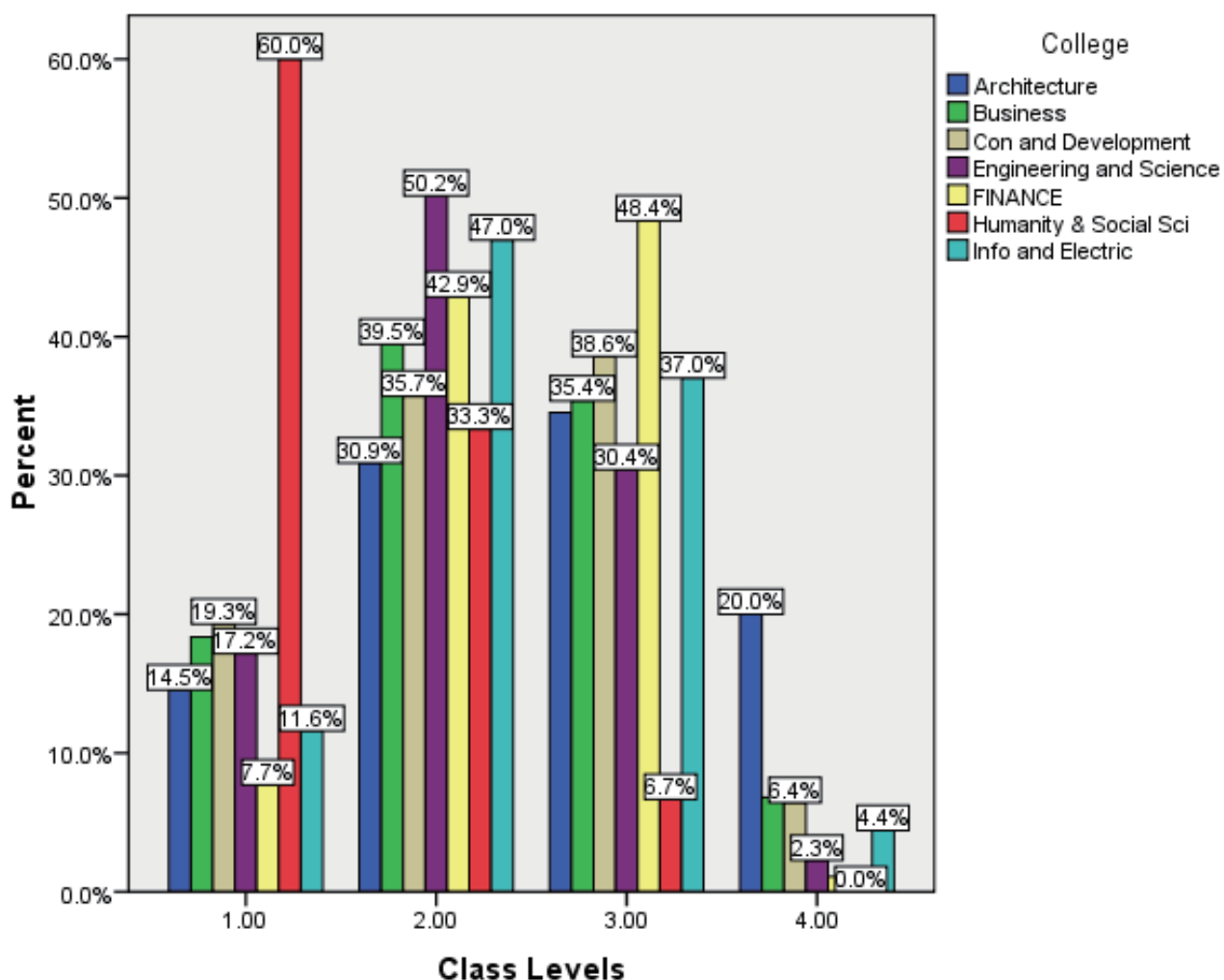


Figure 1. Placement of entry-level freshman students in four levels of English by college

The Center conducts annual surveys with its approximately 90 teachers in order to keep abreast of current issues and to support faculty and student concerns. The Survey for 2018-2019 asked faculty to retrieve information from their students about their participation in and their accomplishments with the initial ER Implementation across all Freshman English courses, starting in September 2018.

Methods

Teachers were asked to collect information about three thematically organized sets of questions from their students and submit the information about their best or “top” reader, keyed to the number of words reported by *M-Reader*, and their least proficient, or “bottom” reader, again keyed to the words reported. Data about student colleges and gender was submitted separately by students in response to a different questionnaire they answered individually. Data on vocabulary acquisition is from the (online) *New Vocabulary Levels Test* (Webb, Sasao & Ballance, 2017).

Theme A: amount of words read (calibrated and recorded on M-Reader for each student)

How many words did your top/bottom reader read for fall semester?

How many words did your top/bottom reader read for spring semester?

How many words did your top/bottom reader read for the year?

Theme B: growth in vocabulary complexity

What was the starting vocabulary score for each of them at the 1000-word level?

What was the finishing vocabulary score for each of them at the 1000-word level?

What was the starting vocabulary score for each of them at the 2000-word level?

What was the finishing vocabulary score for each of them at the 2000-word level?

Theme C: midterms, exams and attendance

What was the fall midterm score for your top and your bottom reader?

What was the spring midterm score for your top and your bottom reader?

What was the final exam score for your top and bottom readers for the fall?

What was the final exam score for your top and bottom readers for the spring?

How many classes did your top and bottom readers miss in fall?

How many classes did your top and bottom readers miss in spring?

All statistical analyses were performed using SPSS version 16.0 (2007). Descriptive analyses were accomplished using Excel (Microsoft Excel Spreadsheet 2017). Word analysis was assessed using the online *New Vocabulary Levels test* (Webb et al., 2017) and supplemented by *VocabProfiler* in the online *Compleat Lexical Tutor v. 8.3* (Cobb, 2004-2019).

Findings

Thirty-nine out of one hundred and twenty-one classes turned in responses, for a return of 32%; data from 2 classes were omitted for incomplete information, leaving a total of 37 classes for data analysis. An individual survey asking their attitudes about ER and

eliciting information about College and gender is discussed elsewhere (Davis, Shih & McCollister, 2019); 2,454 of 3,800 students participating in ER responded, or 64.6%.

Theme A: Increase in words read

Huffman (2014, p. 18) identified a number of studies from 1991 to 2003 that found positive increases in vocabulary acquisition after participating in ER. Iqbal (2017) found gains in vocabulary recognition and retention by elementary-level students. Introducing a new strand of Research into Practice in the journal *Language Teaching*, Paul Nation, one of the most respected scholars in second-language teaching and research, focuses on vocabulary, identifies the utility of extensive reading, comments on the apparent loyalty to instructor-centered instruction which might account for why it is not more frequently implemented, (Nation, 2011, p. 532). His work initiates a spate of studies, replication reports of earlier work, and theory-based responses over the next 8 years.

For our initial investigation, we looked first for changes from one semester to the next in the amount of words read by top and bottom readers, as shown in Tables 2 and 3 and presented by levels in Figure 1.

If we were to array Feng Chia students at entrance by their CEFR scale attainment, Level One students (n=451) would place at A/A1, beginner or elementary facility. Level Two (n=1195) would place at A2; Level Three (n=730) would place between CEFR A2 and B1 and Level Four students (n=78) would place into B1, moving toward B2 (Davis, Shih, & McCollister, 2019). These placements affected our target assessment of vocabulary attainment at the level of the most frequently used 1,000- and 2,000-word families (Cobb, 2019).

To be more confident in our findings, we submitted them to four statistical tests: see Table 3, using number of participants as a group variable.

The number of words read by the top readers was significantly higher than the bottom reader for the first semester ($U = 47, p < .001$), the second semester ($U = 28, p < .001$) and for the whole year ($U = 34, p < .001$): see Figure 2, which breaks out words read by Levels One through Three (Level Four data was incomplete).

Did they, however, meet the targets set by the Foreign Language Center? Table 4 shows targets.

Table 2: Means for Average of Words Read by Top and Bottom Readers (fall and spring)

	Reader	N	Mean	Std. Deviation
Words read for Fall semester, all levels	Top Readers	37	127850	82867
	Bottom Readers	37	16536	22694
Words read for Spring semester, all levels	Top Readers	37	121170	47277
	Bottom Readers	37	12678	20252
Words read for the year, all levels	Top Readers	37	249020	101288
	Bottom Readers	37	29214	34057

Table 3: Testing Dependability of Our Findings about Words Read

	Number of words the readers read for Fall	Number of words the readers read for Spring	Number of words the reader reads for the year (both semesters)
Mann-Whitney U	47.000	28.000	34.000
Wilcoxon W	750.000	731.000	737.000
Z	-6.903	-7.149	-7.037
Asymptomatic Significance (2-tailed)	.000	.000	.000

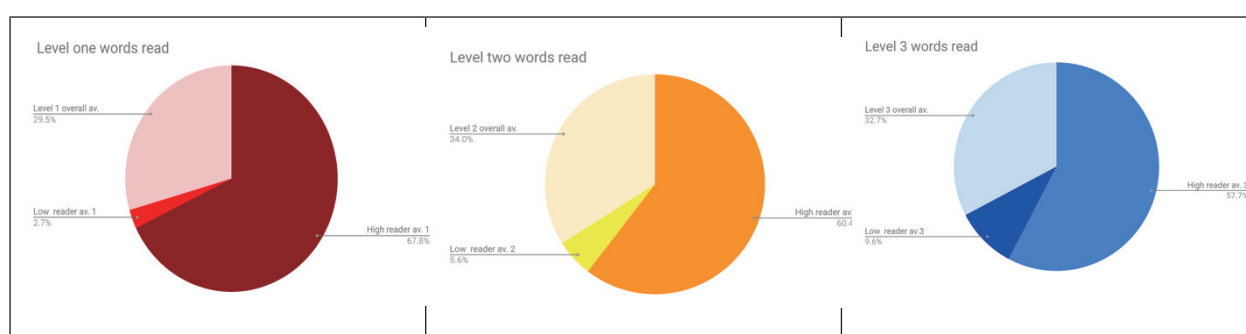


Figure 2. Words read by top and bottom readers in three levels for spring and fall semesters

Table 4: Annual Target of Words to be Read by Semester for Freshman Students at Each Level

Level of Class	Fall Semester	Spring Semester	Yearly Total
1	40,000	40,000	80,000
2	80,000	80,000	160,000
3	100,000	100,000	200,000
4	100,000	100,000	200,000

As shown in Table 5, Level One students did not meet their goals for either semester, although the median shows that at least 50% exceeded the goal. Level Two participants met their target in the second semester. Levels Three and Four met the targets in both semesters, and at least 50% of the participants from Levels Two, Three and Four exceeded the target each semester. When H_0 , the null hypothesis, is rejected at .05 level of significance, we mark it with an asterisk.

Theme B: Vocabulary attainment

The amount of words read does not tell the whole story as Schmitt, Cobb, Horst and Schmitt (2017) reported from their review of replication studies. There is, for example, a crucial difference between coverage and size, studies of which need recalibration, says Schmitt et al. (2017), using corpora that are larger than those available to Nation in 2006. At that time, Nation found that roughly 3,000-word families would allow 95% coverage of an average text, and the lack of roughly 5% of word meanings would not deeply discourage the language learner

Table 5: Meeting the Target for Number of Words from ER Reading

Class Level	Semester	Null and Alternative Hypotheses (Ho & Ha)	Mean	Median	One Sample Wilcoxon Signed Ranks Test value
Level 1	Fall	Ho: Median \geq 40000	33982	40686	6606*
	Spring	Ha: Median $<$ 40000	37420	40762	6660*
Level 2	Fall	Ho: Median \geq 80000	68631	80371	38790*
	Spring	Ha: Median $<$ 80000	130493	144007	95072
Level 3	Fall	Ho: Median \geq 100000	94290	101827	27374
	Spring	Ha: Median $<$ 100000	172313	189279	52886
Level 4	Fall	Ho: Median \geq 100000	107201	103914	926
	Spring	Ha: Median $<$ 100000	238645	210942	1596

from continuing (Schmitt et al. 2017, p. 217). Vocabulary researchers such as Schmitt, Nation and Kremmel (2019, p. 4) are now calling for greater emphasis on the validation of tests, a refinement of their scope and “better understanding of both vocabulary and language assessment issues” among classroom teachers as well as testing and vocabulary specialists.

Figure 3 displays average scores for word family attainment at the beginning and end of the academic year by top (high) and bottom (low) readers for Levels One to Three. Lower-level, or bottom readers (Levels One and Two) improved proportionately more than more advanced readers. For example, high, or top readers in Level One improved almost as much as those in Level Three (and more than Level Two). Level One also improved proportionately more than other levels on vocabulary for 2000-word families.

Can significance be attached to the college of the participants? As depicted in the table below, for Level One in the first semester, there is no significant difference in the number of words read by respondents grouped according to their college. The

same can be said for Level 4 both for the first semester and second semester, indicating that the number of words read by respondents grouped according to their college were just the same.

Table 6: Words Read by Class Level (fall and spring semesters)

Class Level	Semester	Wilcoxon Signed Ranks Test value
Level 1	1 st Semester	10.781
	2 nd Semester	13.064*
Level 2	1 st Semester	20.882*
	2 nd Semester	24.735*
Level 3	1 st Semester	15.501*
	2 nd Semester	17.968*
Level 4	1 st Semester	11.116
	2 nd Semester	5.1366

On the other hand, for Level 1 second semester, there is a significant difference ($p < 0.05$ level) in the number of words read by the respondents grouped according to their college. As shown in the previous table, respondents in Business and Engineering & Science have a higher mean for

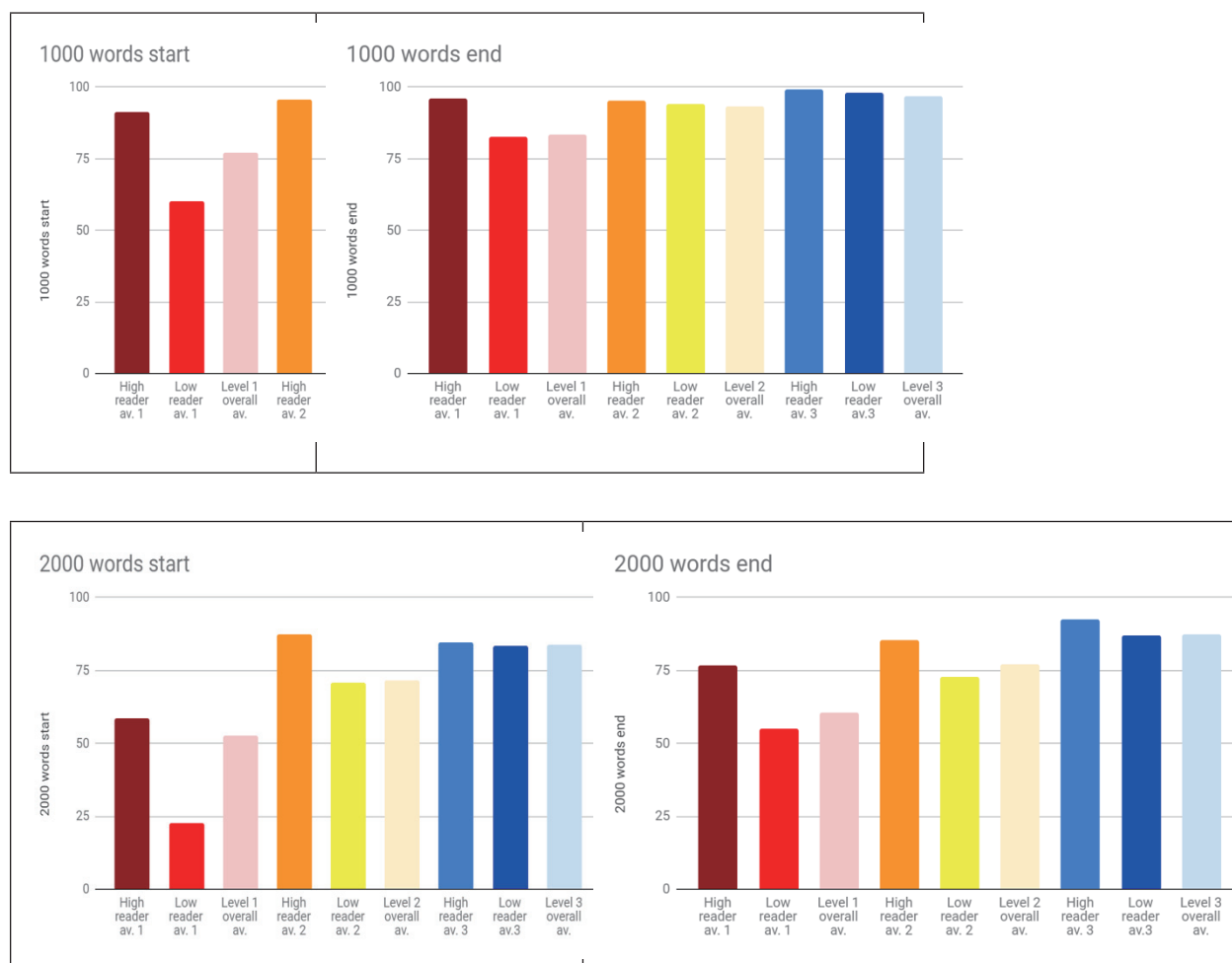


Figure 3. Attainment by levels of 1000- and 2000-word families.

number of words read compared to respondents from other colleges. While for Level 2, there is a significant difference in the number of words read by the respondents grouped according to their college both for 1st and 2nd semester. As shown in the previous table, respondents in Construction and Development and Finance have higher mean number of words read compared to respondents in other colleges.

And lastly for Level 3, there is a similar significant difference in the number of words read by the respondents grouped according to their college both for 1st and 2nd semester. As shown in the previous

table, respondents in Business and Finance have a higher mean number of words read compared to respondents in other colleges.

Theme C: Midterms, exams and attendance

Attendance issues signal academic problems in general for low readers, not just with adding words or incorporating ER. Low readers across all three levels had a greater number of absences from class, particularly in the spring semester, when their average absences rose to between five and six for Level One, just over four for Level Two, and a little over three for Level Three low readers.

Not surprisingly, as illustrated in Table 7, top readers had higher mean ranks (as well as scores) compared to bottom readers for the midterm and final exam scores for the first semester and second semester. In addition, the midterm exam score of top readers was significantly higher than the bottom readers for the first semester ($U = 341, p < 0.001$) and second semester ($U = 373.5, p < 0.001$). The same can be said for the final exam scores: top readers again had significantly higher final exam scores than the bottom readers for both the first semester ($U = 406.5, p = 0.003$) and second semester ($U = 279.5, p < 0.001$).

Fluency Issues

In his state-of-the-art review for Annual Review of Applied Linguistics, William Grabe (2004) lists ten implications for reading instruction, keyed to over a decade of research. Goal seven is “Build reading fluency and rate,” which involves rapid processing of “prosodic and syntactic structures as well as “word recognition accuracy and automaticity” (Grabe, 2004, p. 46). McLean and Rouault (2017) note that only seven studies have looked at how ER and reading rates were associated, listing

them in an Appendix to their study of two groups of Japanese university students. Their study used an experimental research design. McLean and Rouault (2017) explain that the students were randomly assigned to one of the two groups, both of whom were expected to handle 4,000 words a week for the fifteen weeks of the semester. The ER group used graded readers as homework and completed quizzes on their reading using M-Reader in order to record their words and scores. Students assigned to the grammar-translation group read two units a week from published materials, kept homework journals, and did translation assignments which were marked and returned by the instructor. Both groups did timed reading practices on a weekly basis. In a between-groups analysis of reading rates between an ER and a grammar-translation group, the ER group significantly increased their rate in comparison to the other, although both improved in speed and comprehension. The authors believe the ER group, in having read more words, had more efficiently improved their “lower-level reading processes.... orthographic decoding, syntactic processing, and semantic proposition formation” (McLean & Rouault, 2017, p. 102).

Table 7: Ranks for Midterm and Final Exams

Categories for 37 Classes Reporting Scores	Number of Readers by Placement	Mean Rank	Sum of Ranks
Midterm Score of Readers reported for 107-1	37 Top Readers	46.78	1731.00
	37 Bottom Readers	28.22	1044.00
Midterm Score of Readers reported for 107-2	37 Top Readers	45.91	1690.50
	37 Bottom Readers	29.09	1076.50
Final Exam Score of Readers reported for 107-1	37 Top Readers	45.01	1665.50
	37 Bottom Readers	29.99	1109.50
Final Exam Score of Readers reported for 107-2	37 Top Readers	48.45	1792.50
	37 Bottom Readers	26.55	982.50

Testing this area of proficiency with our students will need to be reworked. We had originally planned to use the *New Zealand Speed Readings for ESL Learners* that uses the 1000 most frequent word families (Millett, 2017), and then consider using her Books One and Two which incorporate the list for 2000+ word families and the Academic Word List. We requested students to take the tests associated with these booklets at the beginning, middle and end of the year. And many did so. However, not all courses reported scores for a top or a bottom reader. Two students never submitted anything to their teacher. Several students were apparently confused about whether they were to report their times, the scores, or the fact they had finished a reading and a

comprehension test. We will need to clarify our requests and simplify the process of reporting if we are to discuss improvement rates with confidence.

A note about gender as a potential variable.

Chou (2015) notes the growing emphasis on gender throughout higher education, citing an older study from 2008 that “suggests that women students comprise more than half at the under-graduate level” (Chou, 2015, p. 13). She adds that in Taiwan, female students tend to major in liberal arts or humanities and social sciences. That is only partially the case at Feng Chia.

Table 8: Comparison of Number of Words Read by Gender

Class Level	Semester	Gender	n	Mean	SD
Level 1	1st Semester	Male	113	33400	22442
		Female	66	35100	18447
	2nd Semester	Male	113	33500	16639
		Female	66	44200	35008
Level 2	1st Semester	Male	275	60400	35869
		Female	192	80400	33718
	2nd Semester	Male	275	113000	68003
		Female	192	155000	57464
Level 3	1st Semester	Male	218	90100	43708
		Female	165	98700	33556
	2nd Semester	Male	218	158000	71236
		Female	165	193000	69870
Level 4	1st Semester	Male	22	109000	73106
		Female	34	106000	46330
	2nd Semester	Male	22	264000	223355
		Female	34	222000	60247

It may be that self-disclosed female students at a university emphasizing STEM (*science, technology, engineering and mathematics*) bring slightly different attitudes towards reading in general and ER in particular, a topic which deserves further study. We noticed that while there were slightly more males than females in Levels One and Two, females edged past males when placing into Level Three, and were nearly twice their number in Level Four.

For Level One and Level Four respondents, no significant difference was found in the number of words read between male and female students. On the other hand, for Level Two and Level Three, there was a significant difference in the number of words

read between male and female respondents for both 1st and 2nd semesters. As shown in Table 8, both the mean and median number of words read by female respondents was greater than male respondents, indicating that female respondents have read more words than males.

Interestingly, we wonder if their enrollment in a particular college is associated in any way with these differences, although we suspect that the number of students may be the controlling factor.

For Level 3, there is a significant difference in the number of words read by the respondents grouped according to their College for

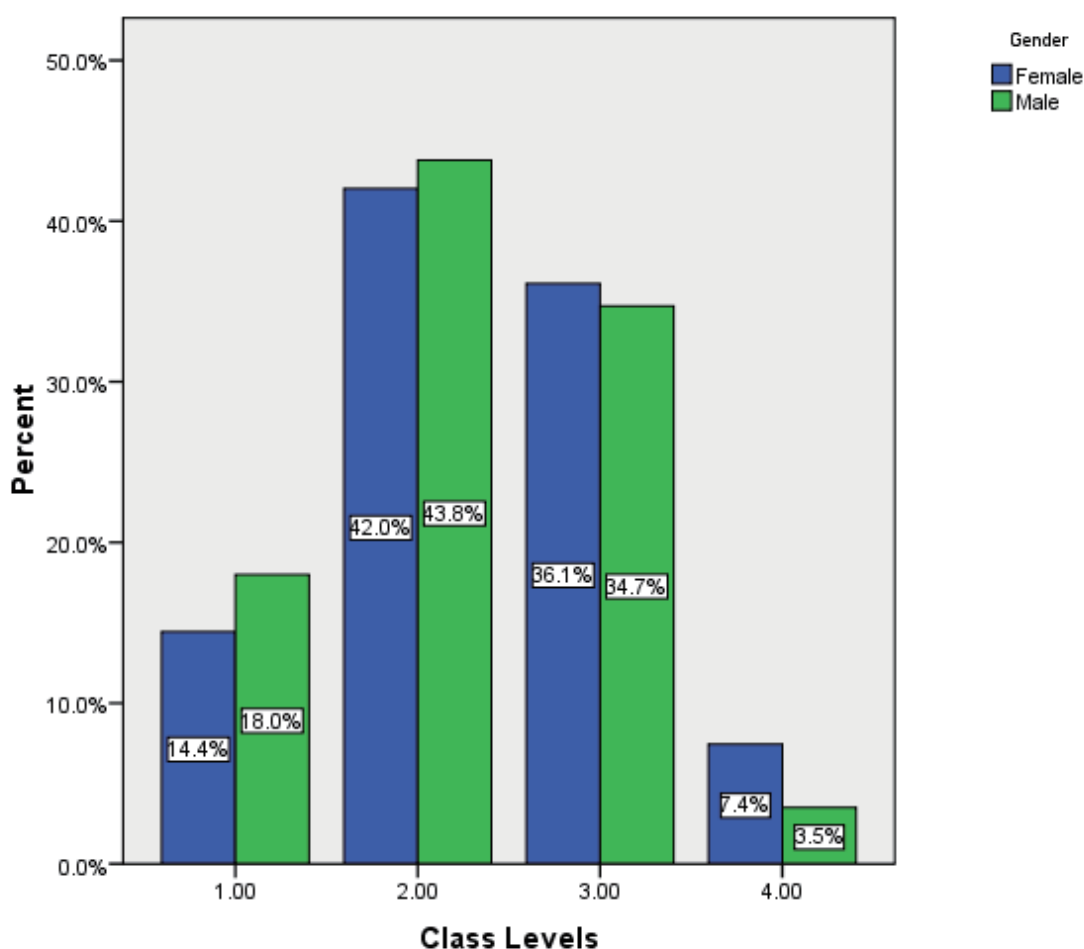


Figure 4. Male and Female placement into Levels 1 – 4

both 1st and 2nd semester. Respondents from Business and Finance have higher means for the number of words read compared to other respondents in other Colleges. Those are also two of the four Colleges in which the female students outnumber males. The other two are Humanities and Social Sciences and Construction and Development. The College of Business enrollment of females is nearly triple that of males, with 15.9% being males and 42.5% females; the College of Finance enrolls about 40% more females: 6.7% are male; 10.7% are female.

Implications

Analyzing our initial efforts to locate characteristics of successful and unsuccessful student readers during our implementation of Extensive Reading across all Freshman English may have shown us more about ourselves as teacher-researchers and our campus than about our students.

The good news: it is reassuring to learn that our students who entered with the lowest level of proficiency, Level One, *almost* met their ER targets and showed the greatest improvement in vocabulary improvement, relatively speaking. We can build on that. And it is not a surprise to see the handful of students who initially placed into Level Four meeting their targets and going well beyond them in both amount of words and vocabulary attainment.

The not-so-good news: poor attendance by lower-level students hampers teachers as well as their individual progress and we need to investigate what may be their reasons behind missing classes. And while Levels Two and Three improved in words read and vocabulary attainment, it seems clear that Level Three could meet greater challenges and we also need to work with

Level Two on attendance and, perhaps, their attitudes toward reading.

It is also clear that we need to revise the process and its explanation for analyzing word rate as part of building fluency. We may also need to look more closely at how Business and Finance seem to have made the case to their students that English will be highly useful to their future internships, international study abroad, and imminent careers, or if that case had been made by the largely female students before they were admitted. We need to compare scores for exams with at least two more years of classes that did and did not incorporate ER. We need some precise statements about vocabulary attainment. We can look to developing experimental research designs across various sections that can incorporate an increasing number of faculty in exciting ways and applaud their efforts. In addition, we can simplify the way data is collected, so that we can have a wider coverage of class sections.

Acknowledgments

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