

Return on Investment Shown in IELTS Scores in an Intensive English Program in a Japanese University

Gavin LYNCH

Abstract

This research reports on four years of results of IELTS testing taken by first year university students in a Japanese university. The IELTS data reported is from economics majors taking higher level English classes in the academic years of 2013 and 2014, and then by liberal arts (culture/tourism/English) majors whose initial focus was English, in the academic years of 2016 and 2017. Initial skill levels, gaps between testing, differences between scores obtained in each skill (listening, reading, writing, speaking), and other factors are explored in order to provide compare investment made in English programs versus the return realized. It was found that return on investment (ROI) in education increases when students are given choices in their education, confirming results found by Lynch and McKeurtan (2011), and Spokes (1989). ROI also seems to increase and become more rapid when an intensive course is taught within a quarter system, instead of a semester system. A group of students who entered the program at a lower level also improved to the same level as an initially higher level group when taught under the same intensive, quarter system program. Questions remain regarding students' performance in some skills, particularly in speaking skills.

Keywords: *Ability Shown in IELTS, Return on Educational Investment, Intensive Program*

1. Introduction: IELTS Testing in a Changing University Environment

This research has its grounding in Lynch (2014) (2015a) (2015b) which outlined how two groups of students (academic year 2013, and academic year 2014) performed in IELTS examinations. Those students were mainly economics students in a Japanese university. The paper claimed that “questions remained to be addressed regarding the students' performance in each individual skill when comparing the first test taking instance of a test with the subsequent instance (i.e., same-test comparison), and also when comparing instances of different test taking with each other (different-test comparison).” Those questions still exist, and this paper will include data allowing insights towards uncovering the answers, from the angle of return on investment (ROI). Investment is taken as hours of education and teacher ability, with return being the scores students obtained in the IELTS examination.

After the 2015 study, subsequent years of testing provided an opportunity to collect further data regarding students' IELTS performance, allowing greater insights. However, the changing environment of the university meant that the economics students did not formally continue to take the IELTS, as those resources were moved to a

new department (of liberal arts), where students ultimately major in culture, tourism, and English. Despite this, comparison could be made as students were all in their first year, with the economics department students taking general education classes (with only a low focus on their major subjects), and the liberal arts students all concentrating on English education, while not yet embarking on their majors until their second year in university. The starting point of the students (initial ability) could also be assumed to be similar, as the economics majors who took the IELTS were the most linguistically able of their peers (in terms of English language ability, as shown on a placement test), and the liberal arts students were similarly skilled, as shown in their placement test.

All students were striving to gain as best an IELTS result as they could, with rewards of various forms offered to students for certain high scores.

2. Background

The IELTS scores are from the academic years of 2013, 2014, 2016, and 2017. The students are called the “Economics Group”, (the former two years) and the “Liberal Arts Group” (the latter two years). The economics group were self-selected to enter what was billed as a difficult class (called the Super Class) and work towards gaining a high score in IELTS (of 5.5 or more) in order to be allowed to study abroad as part of the university roadmap to educational internationalization. The liberal arts group were those who entered a new department of the university (opening in the academic year of 2016), and this new department was also billed as “challenging to enter and work in.” All students in the new department were expected (required) to study abroad, but were told at the beginning that those with high IELTS scores would be given priority when choosing their destination, with others settling for the destinations that remained. A score of 6.0 was advertised as the target standard for the department (a target to aim for over four years of education), but not as a requisite.

The economics group were taught (IELTS) by two teachers, one focusing mainly on reading and writing, the other on listening and speaking, in a “tag-team teaching” methodology. However, some skills cross-over was agreed upon by the teachers, so the students’ education was not limited to only those two skills in each class. They were taught English for at least four classes per week, each class being for 90 minutes. Their English classes were the two classes as outlined above, as well as an academic writing (AW) class and a presentation and discussion (P&D) class. They studied under a semester system (one semester being 15 weeks of classes, with two semesters per year in the Japanese system), and they took the IELTS at the end of each semester. Therefore, the Economics Group had experienced 60 classes of English education before their first IELTS (IELTS 1), and 120 classes of English education before their second IELTS (IELTS 2).

The Liberal Arts Group were taught English (IELTS) as part of what was known as the English Step-up Program (ESP) system. Each of the skills (listening, reading, writing, and speaking), as well as a knowledge class (phrase and expression subject) were taught by a different teacher for two 90-minute classes per week, making a total of 10 classes per week. Therefore, the liberal arts students had a greater number of classes than the economics students. The Liberal Arts Group were part of a department that used the quarter system, which divided the

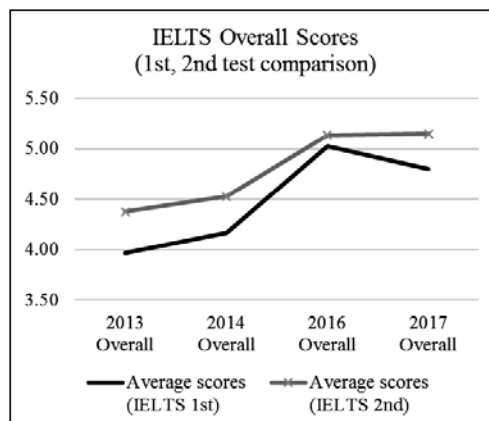
academic year into four quarters of 7.5 classes (plus 0.5 of a class for end-of-quarter examinations) each. Therefore, the Liberal Arts Group had experienced 75 classes of English education before their first IELTS (IELTS 1), and 150 classes of English education before their second IELTS (IELTS 2), both a 25% increase on the Economics Group. They took the IELTS at the end of each quarter.

To reiterate, the Economics Group students took an IELTS examination twice, the first in June and the second in January of each academic year, while the Liberal Arts Group sat their IELTS in June for the first test and August for the second.

3. Data Collection, Analysis and Results

3.1 Data Collection (Some Difference Analysis Results Added to Tables for Compactness)

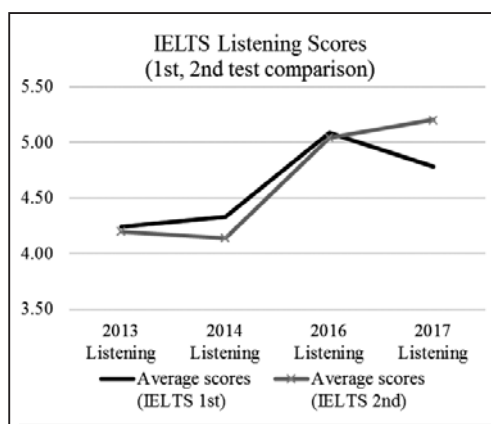
The students sat the IELTS examinations, and the scores were sent to the university from the examination company in digital format, with scores for each skill as well as an overall score recorded for each student. Graphs of the mean overall scores as well as those for each skill for each testing event and for each year present the data at a glance (Graphs 1~5). Following each graph, details are included in Tables 1~5. Other data, such as increases/decreases in shown ability, standard deviations, and statistical difference confidence p-values are included.



Graph 1: Averaged Overall Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

	2013 Overall	2014 Overall	2016 Overall	2017 Overall
n	48	18	36	37
Average scores (IELTS 1st)	3.97	4.17	5.03	4.80
Stdev (1st)	0.559	0.420	0.366	0.376
Average scores (IELTS 2nd)	4.38	4.53	5.14	5.15
Stdev (2nd)	0.467	0.436	0.355	0.349
Means statistically different (p-value)	p=0.0002	p=0.0165	p=0.1998	p<0.0001
Increase	0.41	0.36	0.11	0.35

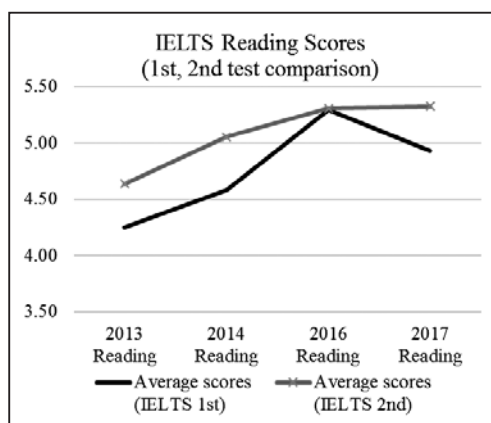
Table 1: Averaged Overall Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years



Graph 2: Averaged Listening Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

	2013 Listening	2014 Listening	2016 Listening	2017 Listening
n	48	18	36	37
Average scores (IELTS 1st)	4.24	4.33	5.08	4.78
Stdev (1st)	0.357	0.569	0.500	0.400
Average scores (IELTS 2nd)	4.20	4.14	5.04	5.20
Stdev (2nd)	0.572	0.614	0.498	0.492
Means statistically different (p-value)	p=0.620	p=0.3424	p=0.7348	p<0.0001
Increase	-0.04	-0.19	-0.04	0.42

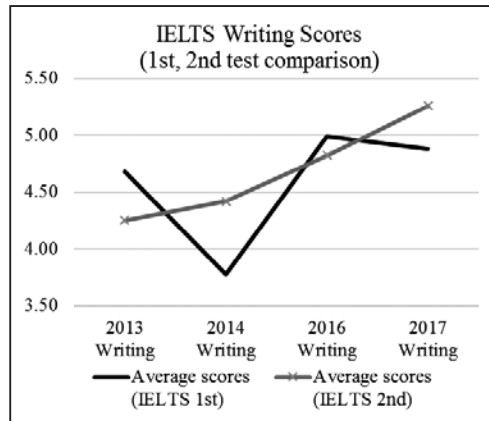
Table 2: Averaged Listening Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years



Graph 3: Averaged Reading Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

	2013 Reading	2014 Reading	2016 Reading	2017 Reading
n	48	18	36	37
Average scores (IELTS 1st)	4.25	4.58	5.29	4.93
Stdev (1st)	0.450	0.600	0.498	0.699
Average scores (IELTS 2nd)	4.64	5.06	5.31	5.32
Stdev (2nd)	0.434	0.684	0.636	0.543
Means statistically different (p-value)	p<0.0001	p=0.0319	p=0.8823	p=0.091
Increase	0.39	0.47	0.01	0.39

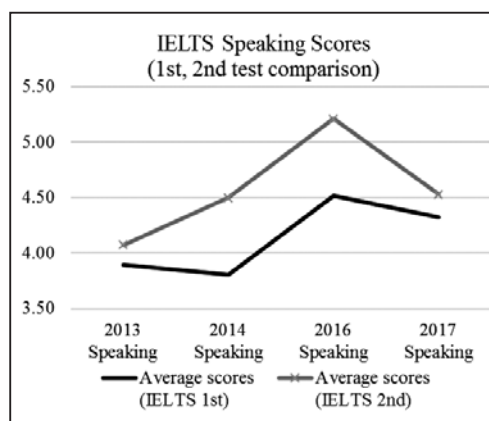
Table 3: Averaged Reading Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years



Graph 4: Averaged Writing Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

	2013 Writing	2014 Writing	2016 Writing	2017 Writing
n	48	18	36	37
Average scores (IELTS 1st)	4.68	3.78	4.99	4.88
Stdev (1st)	0.455	0.691	0.528	0.477
Average scores (IELTS 2nd)	4.25	4.42	4.82	5.26
Stdev (2nd)	0.676	0.575	0.550	0.466
Means statistically different (p-value)	p=0.0004	p=0.0048	p=0.1853	p=0.0009
Increase	-0.43	0.64	-0.17	0.38

Table 4: Averaged Writing Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years



Graph 5: Averaged Speaking Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

	2013 Speaking	2014 Speaking	2016 Speaking	2017 Speaking
n	48	18	36	37
Average scores (IELTS 1st)	3.90	3.81	4.51	4.32
Stdev (1st)	0.765	0.689	0.541	0.615
Average scores (IELTS 2nd)	4.07	4.50	5.21	4.53
Stdev (2nd)	0.737	0.728	0.625	0.471
Means statistically different (p-value)	p=0.2704	p=0.0062	p<0.0001	p=0.1035
Increase	0.18	0.69	0.69	0.20

Table 5: Averaged Speaking Scores for the IELTS, 2013, 2014, 2016, 2017 Academic Years

The statistical software Medcalc® was used to calculate the p-values. The computational notes behind the calculations are as follows (quoted from Medcalc, 2017a):

“This procedure calculates the difference between the observed means in two ... samples. A significance value (P-value) and 95% Confidence Interval (CI) of the difference is reported. The P-value is the probability of obtaining the observed difference between the samples if the null hypothesis were true. The null hypothesis is the hypothesis that the difference is 0.

The program first calculates the pooled standard deviation s :

$$s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

where s_1 and s_2 are the standard deviations of the two samples with sample sizes n_1 and n_2 .

The standard error se of the difference between the two means is calculated as:

$$se(\bar{x}_1 - \bar{x}_2) = s \times \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

The significance level, or P-value, is calculated using the t-test, with the value t calculated as:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{se(\bar{x}_1 - \bar{x}_2)}$$

The P-value is the area of the t distribution with $n_1 + n_2 - 2$ degrees of freedom, that falls outside $\pm t$.”

Values of the t distribution table are given in Medcalc (2017b).

4. Results

The data tells us various information with p values expressing different levels of confidence (in the increase from IELTS1 to IELTS2 for each period). This paper focuses on the ROI (return on investment) in English education, so an observational analysis is sufficient for the most part.

Comparing 2013 and 2014 scores overall scores (Overall Score, Graph 1 and Table 1), it can be observed that the 2014 scores are higher than the 2013 scores. This is true for both IELTS1 (the black line), and IELTS2 (the grey line). This can be attributed to students having a say in their own education as they self-select for participation in the class (instead of being chosen, sometimes against their will), as explained in detail in Lynch, 2015a. What this means, in terms of ROI, is that a greater return can be obtained for the same level of investment. This can be claimed as there was no difference in resources used between the 2013 and the 2014 cohort, and that both groups began at the same level of ability.

It can be seen that both the first IELTS and the second IELTS scores are higher for the 2016 cohort (the Liberal Arts Group), than for the 2013 and 2014 Economics groups. The difference between these groups is:

1. A 25% increase in teaching hours
2. A move to the quarter system from the semester system

From this, it is clear that the increase in teaching hours increases the ROI, and that the quarter system results

in a quicker ROI. In short, the above two factors produced a higher and more rapid ROI.

Comparing the ROI (IELTS scores) for 2016 and 2017, the 2017 group had a lower ROI when comparing the IELTS1 scores (the black line). This correlates to the lower placement test scores that the students entering in 2017 scored (data not given in this research paper but available on request). Therefore, the 2017 cohort began their studies at, on average, a lower English language ability level than the 2016 cohort. However, looking at the second IELTS examination (IELTS2, grey line), the data shows that the 2017 students could catch up with the 2016 students, scoring almost the same. The ROI here is connected to following an intensive program and not reducing expectations of programs outcomes. The students were expected to score as well as the previous year, and they proved able to do it, indicating that a formal, intensive program with high expectations compels students to reach those expected goals.

The other data included is for reference, and to inform further study.

5. Conclusions

The results led to the following conclusions:

1. When students self select, they perform better in IELTS testing than those who do not, despite beginning at the same skill level. In that case, the ROI is higher as a higher return is realised from the same investment.
2. A higher investment leads to a greater return in terms of IELTS testing. Whether this is a greater ROI or not depends on how to value the increase in IELTS scores versus the increase in investment. A greater ROI seems to be achieved when students are part of an intensive program.
3. A shorter study timeframe (i.e., a more intensive course) gives a quicker ROI when the program of study is structured to allow students to focus on their studies in combination with having high expectations. Therefore, a quicker ROI (thus, a higher ROI during that time) is realised when students are part of an intensive program.
4. Groups of students who begin at a lower level can catch up with higher-starting students when they study in an intensive, structured program, in the case where the same results are expected of them.

6. Further Study

This study focused on students' ability as shown in IELTS testing performance during their first year at university. It would be interesting to follow those students for a longer time period, to see how their ability continues to progress (or otherwise). The students in the latter, intensive group, all subsequently joined a four- to eight-month-long study abroad program at the end of their first year (as part of their department's curriculum), and then took the IELTS test on their return. Those results will form part of future research.

Some issues noticed with the 2016 and 2017 groups were that speaking skills do not develop as quickly as other skills (such as reading). A hypothesis that Japanese students need time and/or experiences to develop

speaking skills was suggested, and connects to the above post-study abroad research.

Also, it was seen that initially lower level students find it more difficult than their peers to improve their speaking skills, compared to other skills. A hypothesis that speaking skills naturally lag other skills for those students was proposed. It would be of research interest to find if more evidence exists to support this hypothesis, and to find at what level (of linguistic ability) this is strongest and weakest.

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