

TRANSITION YEAR, YAY OR NAY?

Does participation in Transition Year translate to better Leaving Certificate Results?

INSPIRATION FOR OUR PROJECT

We were inspired to do this project on the topic of Transition Year (TY), particularly because we ourselves entered the programme this year. During our Junior Certificate year, we heard a lot of debates between our peers about whether or not TY is worth the extra year in school. Transition Year is offered in our school as a choice, and we ourselves had mixed opinions of the programme and its worth before starting the project. In our school, TY has proven to be the popular choice with approximately 86% of Junior Certificate (JC or Jcert) students choosing to partake in it. Even with that high percentage, there has always been a general consensus that TY is a 'doss year'. Few people argue that it offers a break between exam years, or an opportunity to develop new skills and maturity, but it has never been hailed as a programme that encourages academic development. But what if Transition Year did have a positive effect on students' academics?

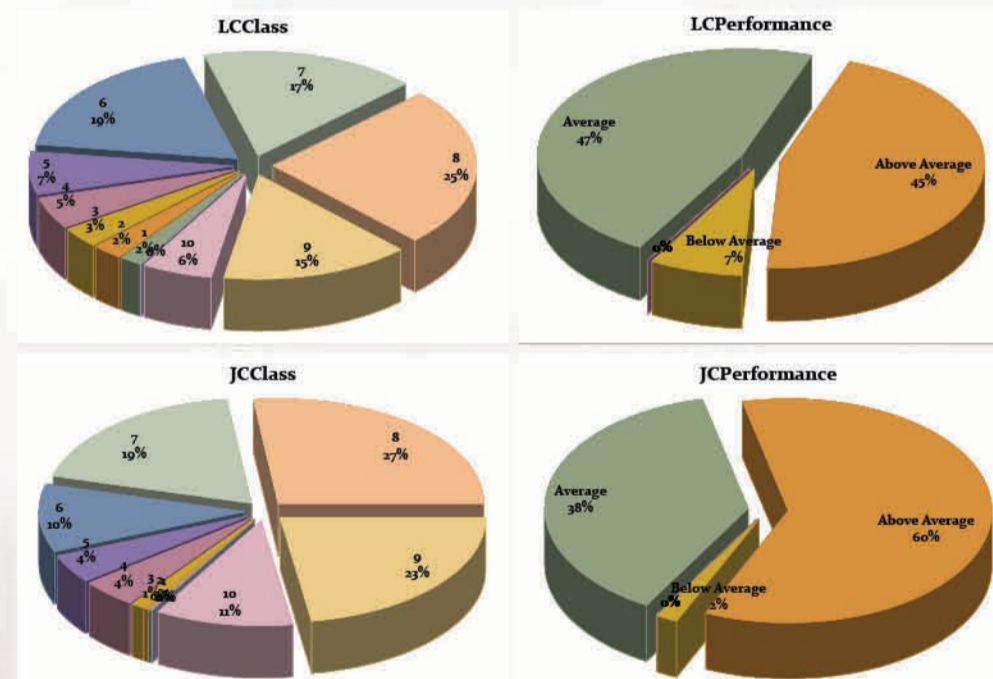
We decided to investigate this further and we were curious to see whether TY students achieved better results in their Leaving Certificate (LC or Lcert) than students who decided against participating in the programme. In pursuing this, we discovered other questions that needed to be answered. Do those who participate in TY already have more academic ability than those who don't? After all, some people who skip TY do so because they dislike school, and may not be academically inclined. This would greatly affect the conclusion of our project. We also needed to investigate the academic worth of TY, by seeing whether TY students' grades improve from their Junior Certificate to their Leaving Certificate, and compare that difference (or lack thereof) with non-TY students.

EXPERIMENTAL METHODS

- Examining existing documents and records. The first stage of our experiment was to obtain a sample of Junior and Leaving Certificate results and to establish which ones belonged to TY students and to non-TY students.
- We used the range below: where percentage is points/maximum points*100 for Leaving and Junior Certificate.
- Data for students transferring in and out of the school were used in a limited way as their Jcert and Lcert results respectively were not available.

Percentage Range %	Class
1-10	1
11-20	2
21-30	3
31-40	4
41-50	5
51-60	6
61-70	7
71-80	8
81-90	9
91-100	10

From there we sorted the results into Above Average (Class 8-10), Average (Class 4-7) and Below Average (Class 1-3)



Point Systems for conversion of grades

We converted Leaving cert results using the CAO points system. We did the exact same thing for the Junior Certificate results, except unlike the Leaving Certificate there was no official point system in place for us to apply to the results. So we needed one for ourselves that would strongly correlate with the CAO point system

The system developed uses each student's best eight subjects out of a maximum of 12, which are mathematically derived. Out of these eight, four of them have to be the four compulsory Junior Certificate subjects (Maths, Irish, English and CSPE) except where Irish exemptions apply. The system recognises achievement at different grades and at four different levels (Higher, Ordinary, Common and Foundation). The grades at Higher and Common Level are rated equally. The system is able to incorporate both Junior Certificate grades and the new Junior Cycle grades, though the latter doesn't apply to our project. The maximum amount of points that can be achieved is 825. From our observations at the end of our project, we were able to incorporate a strong Leaving Certificate points prediction component, based on the points achieved in the Junior Certificate.

Data Summary and Characteristics

2018 LeavingCert			2017 LeavingCert		
Size	150	54,440	Size	136	55,770
Statistics/Parameters	Our School	All Ireland	Statistics/Parameters	Our School	All Ireland
Mean	407	338	Mean	399	335
Median	430	348	Median	424	345
Standard Deviation	126	143	Standard Deviation	122	143
Skewness	-1	0	Skewness	-1	0

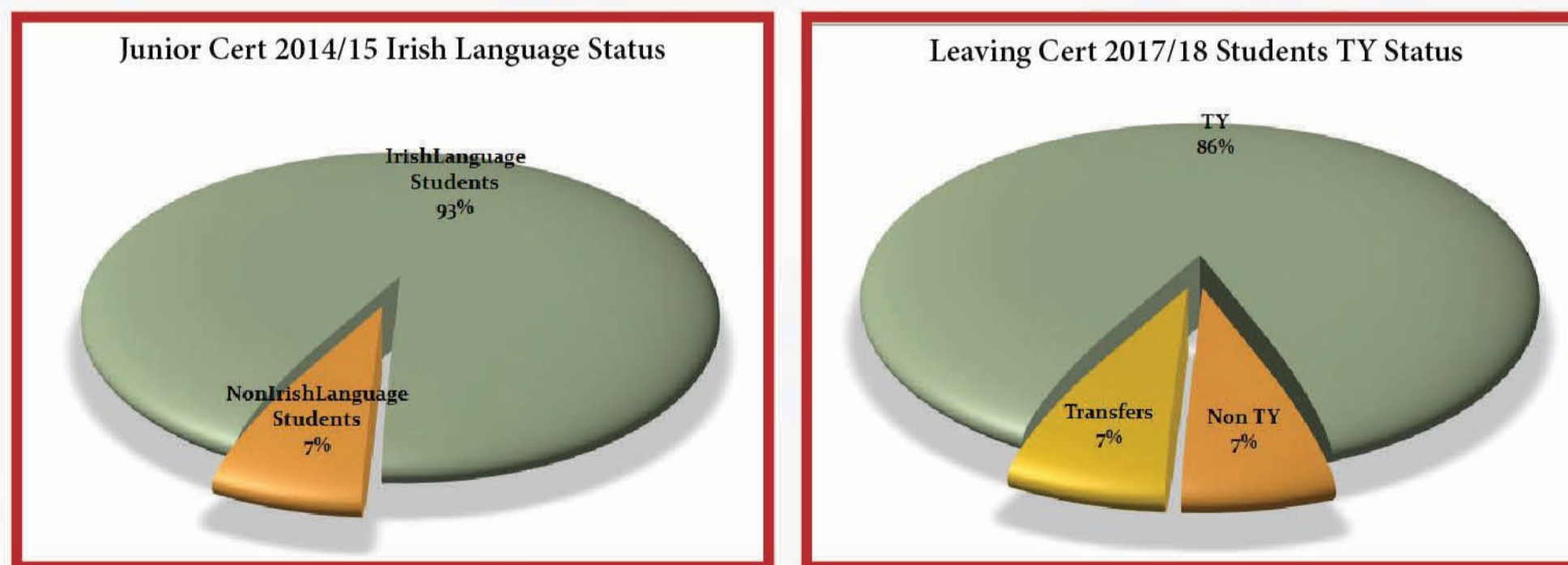
Test	Null Hypo	Alt Hypothe	Variances	Deg Freed	F-Value	CritValu	P-value	SigLevel	Significant?
Lcert-NonTYvsTY	SD Equal	SDNotEqual	525.54/323.93	40/244	1.6224	1.548	0.0296	0.05	Yes
Jcert-NonTYvsTY	SD Equal	SDNotEqual	436.29/190.23	51/244	2.2935	1.4919	0	0.05	Yes
LcertVSIcert	SD Equal	SDNotEqual	395.01/275.42	285/296	1.4342	1.2589	0.0022	0.05	Yes
TY-LcertVSIcert	SD Equal	SDNotEqual	323.93/190.23	244/244	1.7028	1.286	0	0.05	Yes
NonTY-LcertVSIcert	SD Equal	SDNotEqual	525.54/436.29	40/51	1.2046	1.7901	0.5263	0.05	No

Test	Null Hypothe	Alt Hypothesis	n	AD	P-value	SigLevel	Significant?
LcertTotal	Data Normal	Data not Normal	286	3.905	<.005	0.05	Yes
LcertTY	Data Normal	Data not Normal	245	2.738	<.005	0.05	Yes
LcertNonTY	Data Normal	Data not Normal	41	0.603	0.11	0.05	No
JcertTotal	Data Normal	Data not Normal	297	2.466	<.005	0.05	Yes
JcertTY	Data Normal	Data not Normal	245	0.996	0.012	0.05	Yes
JcertNonTY	Data Normal	Data not Normal	52	0.253	0.722	0.05	No

AD is Andersen Darling test value

LCSubjectNo	No of Students	Percent	JCSubjectNo	No of Students	Percent
1	1	0.35%	1	1	0.34%
5	8	2.80%	6	1	0.34%
6	26	9.09%	9	10	3.37%
7	229	80.07%	10	29	9.76%
8	22	7.69%	11	255	85.86%
	286	100.00%	12	1	0.34%
				297	100.00%

We assumed that the class mark for the open class is 49.5 CAO points in order to calculate the population Mean and SD using the principles of grouped data analysis. The open class <100 is slightly less than 7% of the population size. Data for the population is from cao.ie. While our sample data is slightly negatively skewed, the population is approximately symmetrical and our calculations of population parameters largely agree with the empirical rule.



STATISTICAL ANALYSIS

We used Minitab Statistical software to analyse all of our data for our hypotheses. Before we attempted to prove any hypothesis however, we first wanted to establish whether the data had a normal distribution. We found that both the Leaving Certificate results and the Junior Certificate results, did not follow a normal distribution. The departure from normality was not large, and was only caused by the presence of extreme outliers in the data. For further analysis in the project, we still decided to use standard statistical tests, because of the Central Limit Theorem, which allows us to assume normality if the sample size is greater than 30. Using Chi-Square test of association, we primarily wanted to investigate whether there is an association between TY Status (TY or NonTY) and Performance (Above Average, Average, or Below Average) for the leaving certificate. The results of this and other tests are summarised in the tables that follow.



Test Group	H0	H1	α	n	Method	TestStatistic	DegFrdm	\bar{x}	μ o	s	Test Value	CriticalValue	P-value	Significant?
TransitionYr VS Lcert	$p1=p2=p3$	$p1 \neq p2 \neq p3$	0.05	265	ChiSquare	$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$	2				25.74	5.991	0.0000	Yes
Juniorcert VS TransitionYrStatus	$\mu1=\mu2$	$\mu1 \neq \mu2$	0.05	297	One Way ANOVA	$F = \frac{MS(TI)/MSE}{t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}}$	1/295				55.88	3.68	0.0000	Yes
Jcert VS Lcert- NonTY	$\mu = \mu o$	$\mu > \mu o$	0.05	20	Paired t test		19	-17.65	0	9.66	-8.17	1.729	1.0000	No
Jcert VS Lcert- TY	$\mu = \mu o$	$\mu > \mu o$	0.05	245	Paired Z test	$z = \frac{\bar{d} - \mu_0}{\sigma_d/\sqrt{n}}$		-7.76	0	9.24	-13.14	1.645	1.0000	No
Juniorcert VS TransitionYrStatus	$\mu1=\mu2$	$\mu1 \neq \mu2$	0.05	297	Kruskal Wallis	$H = \frac{12}{n(n+1)} \sum R_j^2 - 3(n+1)$	1				33.62	3.841	0.0000	Yes
Jcert VS Lcert- TY	$\mu = \mu o$	$\mu > \mu o$	0.05	245	Paired sign test	$z = n \operatorname{sgn}(\operatorname{sgn}(1-p))$	Mdn used	-7.00	0		-11.44	1.645	1.0000	No

We used additional non parametric tests to further confirm some of our hypotheses

LC Points versus TYStatus, JC Performance

Factor	Type	Levels	Values
TYStatus	Fixed	2	NonTY, TY
JC Performance	Fixed	3	Above Average, Average, Below Average

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
TYStatus	1	16035	16035	2.48	0.116
JC Performance	2	689282	344641	53.36	0.000
TYStatus*JC Performance	2	5837	2918	0.45	0.637
Error	259	1672696	6458		
Total	264	3921406			

Incremental Performance in Points % Lcert vs Jcert

Factor	Type	Levels	Values
TYStatus	Fixed	2	NonTY, TY
JC Performance	Fixed	3	Above Average, Average, Below Average

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
TYStatus	1	78.9	78.85	0.94	0.332
JC Performance	2	460.8	230.41	2.76	0.065
TYStatus*JC Performance	2	90.2	45.12	0.54	0.583
Error	259	21613.4	83.45		
Total	264	24398.2			

CONCLUSIONS

Our sample consists of 286 students from our school. We looked at their Junior Certificate (2016/2015/2014) and Leaving Certificate (2018/2017) results, and converted them into points. We then used Minitab statistical software to analyse the data, from which we came to these conclusions at 95% confidence level or 5% significance level:

- We reject the null hypothesis that TY Status has no association or relationship with Leaving Certificate performance.
- We reject the null hypothesis that performance in the Junior Certificate does not affect the choice to do TY.
- We fail to reject the null hypothesis that says that there is no improvement in performance from the Junior Certificate to the Leaving Certificate.
- Our first two way ANOVA shows that Junior Cert performance-which sums up a student's ability, determination and exam preparedness- is the only statistically significant factor in Leaving cert performance. TY students do better in LC because those with highest ability do TY. The two factors of TY Status and Jcert performance do not impact each other to affect the LC results. ANOVA test is robust with slight departure from normality.
- Our second two way ANOVA confirms the Paired t, Paired Z and Paired Sign tests in the Summary statistics table above that show that TY Status and Jcert performance factors do not help to improve LC results. Students that do not participate in TY suffer a much larger decline in their grades. 95% of non TY students had a reduction in their performance to give an average reduction of about 18%, while 82% of TY students had a reduction in their performance to give about 8% average reduction.
- This shows there is no room for complacency for students in their expectation for the Leaving Certificate as determination, diligence and commitment is needed to equal or surpass the Junior Certificate performance.

RECOMMENDATIONS

- We have evidence at the 99.99% level of confidence that our sample mean differs significantly from that of the population, and at 96% confidence level for the standard deviation, thus we cannot extrapolate and use our results for inference about the population. Therefore, we recommend a larger study covering the nation to achieve this purpose, perhaps including more factors. We have anecdotal evidence that the TY is beneficial in helping students engage in independent self directed learning, mature and develop without the pressure of an exam, develop general, technical and academic skills including career path, but testing these claims is more difficult and subjective, neither is it within the scope of our study.
- A nationwide emphasis on the positive impact of TY as a whole.
- More surveys to identify and improve poor TY facilities and programmes in schools.