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Consistency of Academic Performance in Higher Education: A Study of an Irish Business Degree Programme.

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Abstract

This study examines the level of consistency of the academic performance of business students, both as a whole and within two fields of study – accounting and human resource management (HRM). The examination results of 177 students are ranked at different stages and compared with the rank of final year exam results. By utilising Spearman's (1904) coefficient of rank order correlations rather than absolute marks, this paper hopes to facilitate the process of comparison. The research found that the level of consistency increases substantially once students enter the degree irrespective of their field of study.

Introduction

This study aims to examine the level of consistency of the academic performance of business students, both as a whole and within two fields of study – accounting and human resource management (HRM). The research focuses on the consistency of that majority of students who have completed one business degree programme, on schedule, in the National College of Ireland. This paper examines the relationships between academic performance at entry qualification level and within the business degree. Assessment results in the final year of the degree are ranked and then correlated with the ranked assessment results of previous years in the degree as well as with entry qualifications. For the purposes of this paper the level of correlation between different stages indicates the level of consistency of academic performance. In the short-term it is hoped that this will provide students and those interested in academic performance with an overview of relative academic performance which may stimulate reflection. Further research establishing trends in consistency across courses, institutions and countries may provide a basis for subsequent targeted examination of the underlying causes of these relationships. By utilising rank order correlations rather than absolute marks, this paper hopes to facilitate comparison of academic consistency nationally and internationally. Thus, in time, it is hoped that a national or international picture of performance relationships will indicate fruitful avenues of investigation into the causes of such performance. Much of the literature suggests some degree of consistency between academic performance but that the level of consistency varies according to field of study. Although there is a body of research on academic performance in the field of accounting (Bouillon and Doran, 1991; Clark, 1995, Koh and Koh, 1999; Gammie et al, 2003), there is relatively little available on academic performance in the field of human resource management (HRM).

BACKGROUND

The National College of Ireland offers courses in Business, Computing, Informatics and Community Development. It is a state-funded institution with awards conferred by the Higher Education and Training Awards Council (HETAC). The BA in Accounting and HRM (the degree) commenced in 1991 and is a three year full-time course providing a general business background for a specialised education in either the management of the financial or human resources of organisations. The course is comprised primarily of students entering directly from second level education with up to 30% of places in total reserved for mature and transfer students as well as students from disadvantaged backgrounds. The degree is accredited by HETAC and has examination exemptions from both the HRM and accounting professional bodies. In year one students study six subjects in total. In years two and three students must select either the accounting or HRM stream. They then study two common subjects and three specialist subjects.

Literature Review

This section examines the nature of the relationship between earlier academic performance and degree performance. This relationship is further analysed by field of study.

Degree Performance and Earlier Academic Performance

Much of the research in this area demonstrates some degree of correlation between final year degree performance and earlier academic performance. The nature of these relationships seems to vary across fields of study and institutions. Early work by Sear (1983) shows a small but significantly positive correlation (0.3) between A level score and final year degree result. Peers and Johnston (1994) meta-analysis of previous studies in the area found that A level and university and polytechnic final year degree performance display a small but significantly positive relationship correlation of 0.28 overall. Peers and Johnston (1994) concluded that success in final year degree examinations is related to success in entry qualifications but is also influenced by other factors such as learning approach and environment. In reviewing literature from Thomas, Bol, and Warkentin, (1991) and Entwistle and Entwistle (1991) they suggested that a close match between entry qualifications and higher education performance is not to be expected or even desired given the expected development of conceptual understanding and more mature study habits at higher education. In American research, House (2000) found that high school class percentile rank and ACT (American College Testing) score were significant predictors of first year degree performance among science, engineering and maths students. In Irish research Moran and Crowley (1979) identified that the pass rate in first year increases monotonically with performance in Leaving Certificate with clear cut differences between students with low and high scores and between different fields of study. The Points Commission (Lynch et al, 1999), found a clear relationship between Leaving Certificate Grade

Point Average (LCGPA) and performance in higher education at first and final years of award. However, this relationship is not linear with the LCGPA of first class award students slightly below that of second class honours award students. This study also indicates that the relationship is indirect rather than direct with a number of factors mediating the relationship including institution type, field of study and gender.

Academic Performance Differences between Fields of Study

International research indicates that the consistency of a student's degree performance can vary widely across field of study and across institutions even within the same field of study. Most of this research centres on Arts, Humanities, and Science. These fields of study will be reviewed to establish a broad context for the results of this research in the accounting and HRM fields of study. Within the field of business management education, there has been some research on performance within the accounting field of study. However, there is little evidence of research on educational performance in HRM or Personnel Management.

Peers and Johnston (1994) identified that the relationship between entry qualifications and final year degree performance differs according to field of study. The correlation is higher for medicine, science, language and engineering (0.3 – 0.36) and lower for social sciences, architecture and arts (0.15 – 0.25). Chapman, K. (1996) also found that this relationship varied with the field of study with the strongest correlation for biology (.47) and the lowest for politics (0.23). The correlation for accounting in this study was 0.35. Irish research by Moran and Crowley (1979) on the link between Leaving Certificate results and first year degree performance identified engineering as the field of study with the highest correlation coefficient (0.714). In research by Lynch et al (1999) students in the university and college of education sectors with roughly identical LCGPA were more likely to be awarded a first or upper second class degree in the science field than in humanities. However, in the institutes of technology, students in the humanities were awarded the highest grades. While LCGPA was higher for students in the technological field than in science, a higher proportion of science graduates were awarded first or upper second degrees. Also within Business subjects in the University sector, students awarded a pass or third class degree had noticeably higher LCGPA than those awarded a middle or lower second award. Clarke (1995) found that prior study of accounting was the most significant determinant of first year accounting performance but of lesser importance in second year performance. CAO points were not important in terms of pass/fail classification but were important in explaining overall accounting scores in year one.

Description of Research and Methodology

This section of the paper specifies the research hypotheses, the method of data collection and describes the group and sub-groups used for the study. The section also explains how academic performance was measured and the statistical approach adopted.

Research Hypotheses

The research hypotheses are centred on the relationships between three *explanatory* variables and a *dependent* variable. Each explanatory variable is considered separately (univariate analysis). The null hypothesis is that there is no relationship between each of the explanatory variables and final year rank performance for the whole group or the accounting and HRM groups.

Hypothesis One - The Whole Group.

There is no relationship between final year degree performance and:

- (a) Leaving Certificate performance, or
- (b) Year One performance, or
- (c) Year Two performance.

Hypothesis Two - The Accounting Group.

There is no relationship between final year degree performance and:

- (a) Leaving Certificate performance, or
- (b) Year One performance, or
- (c) Year Two performance.

Hypothesis Three - The HRM Group.

There is no relationship between final year degree performance and:

- (a) Leaving Certificate performance, or
- (b) Year One performance, or
- (c) Year Two performance.

Data Collection

The data was collected from the CAO files (Leaving Certificate data) and from the College's examination files (years one, two and final year results data). Where the whole group has been sub-divided on a field of study basis, the performance rankings are based on rankings within each field of study sub-group. The data was processed using SPSS for Windows.

The Group

The group under review is comprised of students who entered the degree by means of the CAO system and who attempted the final year on schedule. Accordingly, mature, transfer and other

'non-standard' entry students and students who repeat a year are not included in this group. The range of CAO points for this group is 305 – 445. Of those students in the accounting sub-group, 83% studied accounting for the Leaving Certificate. Three cohorts who entered the degree in the years 1995, 1996 and 1997 and had completed a full cycle were selected for this research. As the degree encompasses two fields of study; accounting and HRM, the group is also split into two field of study sub-groups. Although students do not choose their field of study until the beginning of year two, the split of the whole group into field of study groups has also been applied to the entry qualifications and year one academic performance variables. A summary of the cohort and group sizes follows in **table 1**.

Table 1: Cohort Student Numbers by Group

Field of Study/Cohort	1995	1996	1997	Total	%
Accounting	34	32	26	92	52%
HRM	45	24	16	85	48%
Total	79	56	42	177	100%

Measurement of Academic Performance and Ranking

Academic performance in the Leaving Certificate is based on the CAO points total of the student. Academic performance in year one of the degree is based on the mean of the results achieved by the student in each of the six individual subjects for that year. Academic performances in the second and final years of the degree are based on the mean over five subjects. Where students have attempted the Leaving Certificate or any degree year exams more than once, only the first attempt has been taken. The academic performance measurements are converted into rank values within the whole cohort and within the field of study group (accounting / HRM) of that cohort. Accordingly, each student has two rank values i.e. a whole cohort ranking and a field of study cohort ranking. The CAO points totals of the students in each of the three cohorts are ranked with the highest total being ranked as one. The mean results of the students in years one, two and the final year in each of the three cohorts are ranked with the highest total being ranked as one. In ranking performance, students with the same performance level constitute 'ties'. If two students had the same CAO points total, the rank value allocated to each of these students is the mean of both ranks applicable to that level of performance. For example, the ranks applicable to the top two students are one and two so the mean rank of 1.5 is allocated to both students.

The decision to translate academic performance into rank format is important in the context of this paper. The use of ranked data involves the loss of detail (in that the rank does not reflect the actual distance between each point on the ranking scale) and also limits the range of

statistical methods that can be applied to the data. There are two reasons for using ranked data. Firstly, the use of ranked data facilitates the comparison of performance across the College and Leaving Certificate systems. In addition, ranked performance data facilitates the comparison of the degree correlations with those of other higher education institutions either within or outside Ireland even though such institutions may have different assessment systems. Secondly, applying the principle of Adam's Equity Theory (Moorhead and Griffin, 1998: 145) we can conclude that students attach importance to relative performance. This theory suggests that people are motivated when they believe they are being treated fairly in relation to others. In an academic context, this means that students compare their inputs e.g. study time and their outcomes e.g. assessment results, with those of another student. If the ratio of input to outcome is perceived to be the same for both people, the individual perceives the situation to be fair and is motivated to continue inputting. The student perception of relative performance is often reinforced by ranking-based selection decisions of organisations recruiting graduates.

Statistical Approach

As the performance data is expressed in rank form, it is ordinal in nature. Accordingly non-parametric tests are applicable (Foster, 1998). The non-parametric test applied in this study is Spearman's (1904) coefficient of rank-order correlation subsequently referred to as 'Spearman'.

Descriptive Statistics

The CAO points mean and standard deviation for the accounting group is a little bigger than those of the HRM group. However the differences between the means, standard deviations and ranges of the whole group and of field of study sub-groups are not substantial. The accounting group performs quite a bit better than the HRM group at the CAO stage as the accounting group have, on average, seven more CAO points than their HRM counterparts. This difference reduces a little as students progress through the degree.

Table 2: *Group CAO Points Statistics*

Group	Group Size	Mean	Standard Deviation	Minimum	Maximum
Accounting	92	374	24	305	445
HRM	85	367	23	320	445
Whole Group	177	370	24	305	445

Results of the Research

Hypothesis One – The Whole Group.

The null hypothesis is rejected by Spearman. The correlation values for years one and two are particularly high.

Table 3: Whole Group: Spearman Coefficients

Explanatory Variables	Spearman Coefficient	Significance (2-tailed)	Number in Group
Leaving Certificate	.275**	.000	177
Year One	.681**	.000	177
Year Two	.744**	.000	177

** = Correlation significant at the .01 level (2-tailed).

Hypothesis Two – The Accounting Group.

As for the whole group, the null hypothesis is rejected in each case for the accounting group by Spearman. The accounting group shows a marginally stronger relationship for the Leaving Certificate variable than for the whole group. The relationships for years one and two for the accounting group are similar to those for the whole group.

Table 4: Accounting Group: Spearman Coefficients

Explanatory Variables	Spearman Coefficient	Significance (2-tailed)	Number in Group
Leaving Certificate	.340**	.001	92
Year One	.651**	.000	92
Year Two	.785**	.000	92

** = Correlation significant at the .01 level (2-tailed).

Hypothesis Three – The HRM Group.

As in the cases of the whole group and the accounting group, the null hypothesis is rejected for the HRM group by Spearman. However the Leaving Certificate correlation for the HRM group is weaker than for the accounting group. The correlations for years one and two for the HRM group are similar. The relationship values for these years are quite strong.

Table 5: HRM Group: Spearman Coefficients

Explanatory Variables	Spearman Coefficient	Significance (2-tailed)	Number in Group
Leaving Certificate	.259*	.017	85
Year One	.702**	.000	85
Year Two	.690**	.000	85

** = Correlation significant at the .01 level (2-tailed).

* = Correlation significant at the .05 level (2-tailed).

In summary, all null hypotheses are rejected. The relationship between each of the explanatory variables and final year ranking is statistically significant in all cases. The relationship strengthens when the student enters the College and continues to get stronger within the College

i.e. from year one to year two, with the exception of the HRM group. The relationships between the explanatory variables and final year ranking are stronger for the accounting group (compared to the HRM group) with the exception of year one.

Discussion and Implications of Research Findings

In this section the findings and implications of the research will be discussed firstly by whole group and then by field of study sub-group. Within each group the discussion is split between entry qualifications and interim degree performance. The findings should be considered within the context of the sample which was selected from one business degree course within one higher education institution. The sample size was 177 and the CAO points range was 300 to 445.

Whole Group - Final Year Degree Performance and Entry Qualifications Performance

As indicated by previous studies (Sear,1983; Peers and Johnson, 1994: Lynch et al , 1999:House, 2000) this study also found a statistically significant positive relationship between entry qualifications and final year degree performance (based on ranking of assessment results). With a Spearman coefficient of .275 this relationship is similar to that reported by Sear (1983) and Peers and Johnson (1994). However, this level of correlation supports Lynch et al's view (1999) that entry qualifications are a far from perfect predictor of performance in higher education. In the light of Peers and Johnson's (1994) comments about the expected change in learning approach from secondary to higher education, this level of correlation seems appropriate. In other words as learning approaches change from one system to the next we would not expect a very strong relationship between performances in both systems. This finding may be of interest to Leaving Certificate students, their families and their teachers. Although Leaving Certificate results are used to gain admission to the degree, performance in the Leaving Certificate is not necessarily reflected in final year degree performance. On this basis Leaving Certificate students should not assume that their Leaving Certificate performance will be consistent with their final year degree performance.

Whole Group - Final Year Degree Performance and Interim Degree Performance

This study also found a strong and significantly positive relationship between interim and final year degree performance. The Spearman coefficient for year one is .681 and for year two is .744. Interim degree performance appears to have a stronger relationship with final year degree performance than entry qualifications do. In essence, the closer the student gets to final year performance the stronger this relationship gets. This increase in the strength of the relationship may be expected for a number of reasons. Firstly, there is a consistency in the measurement of academic performance as each of the stages occurs within the same higher education system.

Secondly, in line with Peers and Johnson's (1994) reasoning, both interim and final year degree performance are based on the development of similar approaches to learning. Thirdly, as students are pursuing a programme of study that they selected it is possible that a 'drive' or motivation factor is relevant.

Between years one and two, there is a number of changes e.g. the subjects, an increase in subject specialisation in the accounting/HRM areas, the number of subjects, class sizes (smaller as split into fields of study), age of student (one year older) etc. However, it is interesting to note that despite these many changes the level of correlation is broadly similar across years one and two. The strong relationship between performance in years one/two and the final year would appear to question the perception of some students that all that matters in years one/two is progressing to the following year. This may give students cause to reflect on their relative performance in years one and two, not just in final year.

Field of Study Sub-Groups - Final Year Degree Performance and Entry Qualifications Performance

Peers and Johnston (1994) identified the correlation between entry qualifications and final year degree result as relatively high in medicine, science, language and engineering (0.3 - 0.36). The correlation for the accounting group is within this range. It is noteworthy that the low correlations (0.15 – 0.25) in Peers and Johnston's study were observed in the social sciences, architecture and arts. It is interesting to note that the HRM correlation (.259) is just outside this range. Chapman (1996) computed a 0.35 correlation for the accounting field of study regarding entry qualifications and final year degree performance. The Spearman correlation coefficient for the accounting group in this study is 0.340 which is similar to Chapman's findings. The level of correlation between entry qualifications and final year performance is higher for the accounting group than for the HRM group i.e. .340 (accounting) as against .259 (HRM). As 83% of the accounting group studied accounting for entry qualification purposes, it is possible that the presence of accounting and the absence of HRM in the entry qualifications curriculum may contribute to part of this difference. As in the case of the whole group, Leaving Certificate students, irrespective of their field of study, should not assume that their Leaving Certificate performance will be consistent with their final year degree performance.

Field of Study Sub-Groups - Final Year Degree Performance and Interim Degree Performance

As in the case of the whole group, each field of study group has much stronger correlations for interim degree performance than for entry qualifications. It is interesting to note that while the

interim degree relationship strengthens for the accounting group (.651 to .785), it remains similar for the HRM group (.702 to .690). Although the levels of correlation differ as between the fields of study, these differences are not substantial. Thus it appears that the choice of field of study, within this degree, does not have a major impact on the relative performance relationships.

CONCLUSION

In conclusion, this study examined the level of consistency of the academic performance of business students within one degree course in one Irish higher education institution. The level of consistency was examined for the whole group and within two fields of study sub-groups – accounting and HRM using Spearman's coefficient of rank-order correlation.

Using rank order correlation, it was found that a weak but statistically significant relationship exists between Leaving Certificate performance and final year degree performance. The relationships between interim degree performance and final year degree performance are much stronger. The above relationships are broadly similar for the accounting and HRM groups within the degree. Thus, it appears that the level of consistency increases substantially when students enter the degree irrespective of their field of study. It is hoped that this research develops into a longitudinal study incorporating a new cohort each year. In this way the results should become more robust with time. In addition, as the sample size increases, the possibility of analysing the data by reference to age, gender and mode of entry may become feasible. It is also hoped to develop the research further by fostering cross-institutional studies in this area through collaboration with colleagues in other higher educational institutions. The use of rank order correlation should facilitate this process.

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