Supporting International Student Achievement – A Literal Pathway from Secondary to Tertiary Study

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Abstract

Research on the achievement levels of international students at secondary and tertiary education levels in New Zealand was conducted in 2004 as a project funded by the Ministry of Education through the Export Education Levy. Analysis of extant data from the Ministry of Education and New Zealand Qualifications Authority provided the basis for comparing international student achievement with the achievement of domestic students at selected New Zealand secondary schools. Results based on the 2003 school data reveal patterns of academic performance of international students by school decile (socio-economic) status, geographic region, subject area and the percentage of international students enrolled. Numbers of international students studying at Years 12 and 13 reveal a tendency to recruit students into the latter year only where their achievement in literacy-rich subjects does not compare favourably to that of New Zealand domestic students. The implications of international student achievement in literacy rich subjects at secondary school are explored in the context of pathways to university study. Specific strategies targeted at improving the success of international students at secondary levels and in line with their career aspirations are discussed.

Key Words

International Students, Academic Achievement, Literacy, Secondary Schools

Introduction

During the past few years, enrolment of full-fee-paying students from overseas to New Zealand secondary and tertiary education institutions has had a significant impact on income. Smith & Rae (2004) report that export education has contributed economic earnings of $545 million in 2000, $1.1 billion in 2001, $1.7 billion in 2002 and $2.277 billion in 2003. In 2003, 117,094 international students were studying in New Zealand secondary and tertiary institutions. An act of Parliament (5 December 2002) introduced a compulsory Export Education Levy for all providers of education to international students which required them to contribute a percentage of their earnings to the government. The Levy funds are held for strategic development work comprising industry development, promotion, quality assurance and research[1]. This economic benefit to host institutions must not, of course, override sound pedagogical practices for students and schools which are required to ensure that these experiences are positive ones for those affected.

Although the portion of the Export Education Levy set aside for research in relatively small (14% in 2004/2005), the 16 projects funded in the 2003-2004 have the potential to make important contributions to our knowledge about export education and the experiences of international students studying in Aotearoa / New Zealand. In their stocktake of New Zealand literature on export education, Ballingall & Smith (2004) noted the lack of robust and systematic research carried out at an industry-wide level reflecting "a lack of coordination in determining the research agenda" (p. 27). Internationally, authors such as Morrison, Merrick, Higgs & Le Metais (2005) have drawn attention to the limited literature on academic achievement of international students suggesting that the focus has been on student experiences as opposed to outcomes. In many ways the Export Education Levy is providing support and resourcing for much-needed research into one of New Zealand's multi-billion dollar industries.

One of the studies funded through the Export Education Levy provided the first information available nationally examining the academic achievement of international students at New Zealand secondary and tertiary levels (Paewai & Meyer, 2004). The study involved analysis of extant data available in existing

[1] Further information on the Export Education Levy can be found at http://www.educationnz.org.nz/levy/index.html

Ministry of Education and New Zealand Qualifications Authority (NZQA) including key results and recommendations for further research. This paper briefly summarises the research procedures and selected results from the Final Report (2004) updated to include data from three additional secondary schools that submitted their data in response to our request after the deadline for inclusion in the report. This expansion of the sample allows additional analysis of patterns emerging in the first report. It also provides opportunity to examine further the implications of international student achievement in literacy rich subjects at secondary school in the context of pathways to tertiary study. Specific strategies targeted at improving the success of international students at secondary levels and in line with their career aspirations are discussed, as are future research directions that may have been hindered by recent changes to national reporting protocols.

Research Summary: Achievement of International Students

A purposive sample of secondary schools was identified based on geographic region and decile (socio-economic) levels, and student results for Bursary (Year 13) and the NCEA Level 3 (Year 12) were compared for two student groups—full-fee-paying and New Zealand domestic (comprising New Zealand European and New Zealand Maori as they were most likely to speak English as a first language).

Of the 23 schools that were invited to submit information for the study, 13 provided usable data. Characteristics of the schools that participated in the study are presented in Table 1.

Table 1: Characteristics of the Schools Represented in the Final Analysis

Characteristic		**Number of Schools Represented in the Final Analysis**
Region	Auckland	6
	Canterbury	4
	Wellington	3
Decile Range	4-7	7
	8-10	6
Percentage of International Enrolments in Year 12	Greater than 10%	6
	Less than 10%	7
Percentage of International Enrolments in Year 13	Greater than 12.5%	8
	Less than 12.5%	5

Some of the major findings for the 2003 school data included:

1. Marked differences in the numbers of full fee paying students enrolled in Years 12 and 13 with three times as many students enrolled in Year 13;
2. International students were less likely to be enrolled in English or other literacy-rich subjects;
3. No differences overall in the percentage of international versus domestic students who did not achieve the standards they undertook, and only slight differences at the achievement, merit and excellence levels;
4. Fewer students failed overall at higher decile schools;
5. International students were less likely to pass Bursary subjects;
6. At bursary level, international students performed better in schools where they comprised more than 12.5% of the total year group enrolment in comparison to those schools in which they comprised less than 12.5% (2004, p. 4).

In addition to these substantive findings, recommendations were made regarding the kinds of disaggregated data that should be collected in future to examine hypotheses raised in this research. The establishment of National Student Numbers (NSNs) in 2003 in particular now allow for longitudinal research to follow

students over time, so that the impact of different study patterns on educational outcomes—leading to academic advice based on research—can be investigated.

Updated Research Findings: Achievement of International Students Revisited

At the completion of the study, the researchers undertook to follow up on those schools that were unable to provide the data required in order to increase the sample size and validity of the results. Repeated attempts to contact appropriate persons at the schools yielded three additional data sets to give a total of 17—three of which remained incomplete.

The results for three additional schools were incorporated into a re-run of selected 2003 analyses at Bursary level. In the original study (Paewai & Meyer, 2004), where a result was returned for less than 10 students in a particular subject area, this group of students were excluded for the calculation of average percentages on the basis that the raw percentage achievement information would have distorted the findings. Further, comparisons between international and domestic students in English and Biology were not conducted due to the relatively small numbers of international students who sat Bursary examinations in these areas. In the final analysis, data from only 12 of the schools was included for five of the seven subject areas originally selected. Sufficient data from two additional schools were provided for inclusion into the re-analysis (for a total sample of 14 schools) and by converting the percentage data to raw scores, the original data set could be examined in its entirety. Table 2 shows the characteristics of the schools represented in the revised analysis.

Table 2: Characteristics of the Schools Represented in the Revised Analysis

Characteristic		**Number of Schools Represented in the Revised Analysis**
Region	Auckland	7
	Canterbury	4
	Wellington	3
Decile Range	4-7	7
	8-10	7
Percentage of International Enrolments in Year 13	Greater than 12.5%	7
	Less than or equal to 12.5%	7

The researchers also intended to re-examine the results obtained for Year 12 students studying NCEA to include data from the additional schools. The original analyses were sorted in order to compare average percentage achievement of NCEA standards (%Not Achieved, %Achieved, %Merit, %Excellence) for New Zealand domestic and full fee paying students. However, a policy change within the NZQA (2004) resulted in removal of the %Not Achieved data which meant that the results presented in the original study could not be compared with those available currently, or even utilized as a baseline for future years.

Results

One of the 2004 research findings related to the "marked differences between numbers of full-fee-paying students enrolled in Years 12 and 13 with three times as many students enrolled in Year 13" (2004, p. 4) supporting anecdotal evidence that large numbers of international students were being recruited for and allowed to study for only one year before going on to university. Revised analyses including data submitted from all 17 schools showed that this result was largely accounted for by practice at a sub-sample of the secondary schools, not all schools as a generalised practice. Approximately half of the schools showed an increase in the numbers of international students studying in Year 13 only (ranging from 10.2% to 128.6%) while the other half showed a decrease (ranging from 5.6% to 55.6%).

Table 3 shows the total numbers of full fee paying (FFP) and New Zealand domestic (NZD—comprising Pakeha and Maori) students examined at Bursary level in 2003 in 14 of the schools in the expanded sample. The results confirm that international students were less likely to sit examinations in English and Biology and more likely to fail the relatively literacy-rich subjects of Economics and Physics. However, international student performance in Mathematics with Calculus and Mathematics with Statistics compared favourably with their domestic student counterparts. Overall at Bursary level, the performance of international students was significantly different ($p<0.05$) to that of New Zealand domestic students.

Table 3: 2003 Bursary result comparisons for NZD and FFP students' pass rates by subject area

Subject Area	Total FFP Students Examined	% of FFP Students who Passed	Total NZD Students Examined	% of NZD Students who passed
Biology	34	64.7	386	79.5
Chemistry	101	83.2	318	90.9
Economics	200	61.5	274	81.0
English	11	81.2	352	83.0
Mathematics with Calculus	292	83.6	414	81.2
Mathematics with Statistics	290	80.3	551	82.9
Physics	151	76.2	289	91.3

Revisiting the finding that fewer student fail overall at high decile schools, Table 4 presents the expanded results for Bursary failure rates in the 14 schools sampled. When disaggregated, many of the ratios and failure rates for each school are distorted by relatively small numbers in some of the student groups precluding the use of a comparative t-test. However given that the schools were evenly divided across the decile ranges (Table 2), and the numbers of examinations conducted within each decile of a similar order, the differences between the performance of both international and New Zealand domestic students across deciles (5.7% and 4.0% respectively) would further support the original finding by Paewai & Meyer (2004).

Table 4: 2003 Bursary result comparisons for NZD and FFP students' failure rates by decile

Decile Range	Ratio of Number of Fails / Number Examined across all subjects		Failure Rate	
	FFP	NZD	FFP	NZD
Decile 4-7 (n=1705)	160/631	198/1074	25.4%	18.4%
Decile 8-10 (n=1973)	89/448	219/1525	19.7%	14.4%
		% Difference	**5.7%**	**4.0%**

One of the more interesting findings from the original study (2004) related to the performance of international students in schools where they comprised more or less than 12.5%[2] of the total enrolment. Table 5 presents the revised results for the 14 schools sampled and provides further support for the previous findings. New Zealand domestic students perform consistently, independent of the percentage of international student comprising the total enrolment (% difference = 1.5%), whereas the 8.1% variation between international students studying in schools where they comprise greater than 12.5% of the total enrolment, as compared to those with less than or equal to 12.5%, suggest that international students were less likely to fail in the former case. However, without the use of a t-test for reasons described earlier and given that *n* is not of a similar order in this instance, this result still remains questionable.

Table 4: 2003 Bursary result comparisons for NZD and FFP students' failure rates by proportion of FFP students

[2] The value of 12.5% at which the split was made was selected to ensure a sufficient number of schools below and above the median values for the purposes of facilitating comparisons.

Proportion of FFP Students	Ratio: Number of Fails / Number Examined across all subjects		Failure Rate	
	FFP	NZD	FFP	NZD
FFP students comprising less than or equal to 12.5% of the total enrolments (n=1402)	88/304	167/1098	28.9%	15.2%
FFP students comprising greater than 12.5% of the total enrolments (n=2276)	161/775	250/1501	20.8%	16.7%
		% Difference	8.1%	1.5%

Discussion

The results of the expanded analyses conducted on selected findings from the Report on the Achievement Levels of International Students (Paewai & Meyer, 2004) provide further support to the following original findings:

2. International students were less likely to be enrolled in English or other literacy-rich subjects;
4. Fewer students failed overall at higher decile schools;
5. International students were less likely to pass Bursary subjects;
6. At bursary level, international students performed better in schools where they comprised more than 12.5% of the total year group enrolment in comparison to those schools in which they comprised less than 12.5% (2004, p. 4).

The inclusion of the additional schools, however, made it evident that it was a sub-sample of secondary schools—not schools generally—that were responsible for the larger numbers of students in year 13 as compared to year 12. We found that approximately one quarter of the 17 schools sampled were accounting for discrepant numbers of students across the final two years of secondary school. Read and Hirsh (2005) report that ESOL departments in secondary schools "believe that most international students require at least two years in a secondary programme to prepare them adequately for university study" (p. 30). In schools where there is a tendency to recruit international students for Year 13 only, the likelihood that that those students will sustain academic disadvantage is markedly increased. Meyer and Paewai (2004) argued that recruitment for year 13 only was not in the students' best interest and may well be evidence of poor pedagogical practice. Allowing international students to attend a New Zealand secondary school for the final year only may be acceptable practice if it can be shown that students have the necessary English language skills to reach literacy levels required for university study a year later. It may be appropriate for the secondary sector to require certain levels of proficiency for different durations of study to better ensure later success at university. Where students do not demonstrate these skills, placement in appropriate coursework to further develop the students' literacy skills should be considered (Meyer & Paewai, 2004).

The change in reporting of secondary results by the NZQA (2004) meant that the researchers were unable to further investigate their finding regarding differences between New Zealand domestic and international student achievement in NCEA. In 2003 and 2004, schools did not report "not achieved" results consistently. It will be important in future that reports of student performance be comprehensive, including information on standards that were not achieved as well as those that were. Policy changes are being considered to address this issue and avoid inconsistencies in reporting practices across schools as well as for the sector. Similarly, discussion is occurring regarding mediation of varying practices associated with student enrolment and withdrawal procedures.

Ballingall & Smith (2004) note the importance of developing and maintaining central databases that monitor aspects of export education such as student demographics, achievement data and service provision because "robust data sets related to New Zealand's export education sector appear to be fairly hard to come by" (p. 27). Although the NCEA results for achievement, merit and excellence standards will continue to be publicly available via the NZQA Website, comparison of student results will not be valid with reference to non-achievement until consistent practices are followed.

The results of this study reinforced that there were clear enrolment patterns with higher numbers of international students sitting Bursary in Mathematics with Calculus and Mathematics with Statistics in comparison to more literacy-rich subjects such as English, Biology and Chemistry. In Economics and Physics, international students were twice as likely to fail than New Zealand domestic students but performed comparably in the Mathematics areas. Using ratios of grade point averages for full fee paying students versus students who were New Zealand citizens, Hunter & Pickering (2002) found that international students who enrolled at university with a general Bursary (as opposed to an 'A' or 'B' Bursary) performed at the lowest level in their first year compared with New Zealand citizens who were similarly qualified. They also found (2002) "in all cases, those with at least a "C" pass in an "English" subject perform better than those without such a pass and, moreover, approach the desired benchmark of a GPA ratio of 1" (p. 5). Even though the results of study reported in this paper are no doubt predictable—we may not expect international students to be interested or do well in Bursary English—it is important to emphasise our obligation to ensure that international students enrolled in Year 13 study literacy-rich subjects if they are to acquire mastery of English as the language of instruction in Aotearoa / New Zealand, and achieve at a level commensurate with New Zealand domestic students at university level.

The concept of 'export education' makes certain assumptions that what we do will have value for international students rather than being simply a commodity that we do for our own benefit. It is important recognize that the underlying reason for students coming to Aotearoa / New Zealand secondary schools is to gain entrance to a university where English is the language of instruction (Meyer & Paewai, 2004). Therefore, what occurs at secondary level must give international students sufficient skill in English to prepare them academically for university entry and *success* in their chosen profession and/or discipline. For better or worse, English is a language of great currency nearly everywhere in the world, and a university degree is often the starting point for meaningful participation in leadership roles whatever one's occupation or career aspirations.

Hunter & Pickering (2002) concluded based on their research that the performance of international students at university level has declined during recent years relative to their New Zealand citizen counterparts. They related the reasons for this decline to inadequate academic preparation and English language skills. In many respects, information from the university sector in particular is critical because in the long run, analyses of university data will be crucial in evaluating whether we are meeting the needs of our international students.

Conclusion

Ideas for future practices implemented to further support the achievement of international students in our secondary schools have already been discussed at the Secondary Principals and Leaders Forum (November 2004) , an ongoing NCEA implementation group jointly sponsored NZQA and Ministry of Education. We support the establishment, across the secondary sector, of an entrance standard comprising a requirement for evidence of English language skills with different requirements for entry at Years 12 and 13. For study in Year 13 only, students could be required to show evidence of English language skill equivalent to a 5.5 overall IELTS; for Year 12, a lower level may be sufficient. Secondly, academic advice including the enforcement of requirements that international students enrol in literacy-rich subjects would undoubtedly support the continued success of those students at the tertiary level. Some schools also assessed the literacy achievement standards based on evidence from literacy rich subjects (e.g., economics or biology) rather than solely on the English curriculum. This would seem to be good practice and more closely aligned to future study at university in the discipline of interest to the student.

Solutions to the literacy issue are not simple, but future strategies should be based on both our values and evidence of effectiveness. Our focus should be on enhancing the academic performance of international students in the long term. The risk of irreparable damage to people, schools and the export education industry in general could be great if we implement short-term solutions—driven by the threat of financial consequences—without a clear evidence base. After all, it is in our best interests to do whatever we can to ensure that students have meaningful opportunities to meet their educational goals.

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