research methodology

2.1 SURVEY POPULATION

RECRUITMENT OF STUDENTS / PROVIDERS

In order to establish a robust and reliable sample of international students to participate in the National Survey of International Students, Deloitte worked with the Ministry of Education and the Department of Labour to draw a random sample of 25,151 international students from the Department's database.

THE DEPARTMENT DATABASE

The Department database contained 75,900 international students with valid permits or visas as at the first of each month between 1 January 2007 and 1 May 2007. The database was filtered to ensure that the sample met the necessary criteria of the Ministry.

The filtering process resulted in a database:

- containing only fee-paying students aged 13-or-over with an education sector recorded as tertiary, secondary or PTE / ELS;
- excluding those without contact details; and
- excluding students who had gained permanent residence.

The result was a database containing 25,151 international students.

TARGET SAMPLE POPULATION

Deloitte provided the Department with the profile of the random sample numbers (target sample size) required from each sector type. As in 2003, a response of 3,000 completed questionnaires was targeted. The 2003 survey did not, however, use a sample distribution that reflected the actual number of students from each sector. The Advisory Group agreed that the responses should reflect the distribution of actual enrolments across sector groups to better ensure a robust and representative sample of international students was obtained.

It was estimated that approximately 9,000 students would need to be contacted in order to achieve the desired sample sizes. The size of the sample for each sector group was calculated in proportion to the size of the total population (i.e. proportional allocation). The Ministry provided the following record of FFP student numbers at August 2006.

T 2.0 **TABLE 2.0**
THE MINISTRY FULL FEE PAYING STUDENTS NUMBERS

Actual August 2006	Secondary School	PTE / ELS	Tertiary		TOTAL
			University	ITP	
Ministry full fee paying students	6,722	28,344	24,681	9,504	69,251
% of total	10%	41%	36%	13%	100%

Using the above proportions the following sample sizes were adopted for the sample of 9,000.

T 2.1 **TABLE 2.1**
NATIONAL SURVEY SAMPLE SIZES

Sample	Secondary School	PTE / ELS	Tertiary		TOTAL
			University	ITP	
Composition of sample	900	3,690	3,240	1,170	9,000

The Ministry perceived value in increasing the sample size for secondary students from 900 to 1,800, increasing the overall sample size to 9,900.

The Department then randomly selected this pre-determined proportion from each sector and provided Deloitte with the selected students' contact information.

In sectors where the Department database failed to provide sufficient student email contact details to draw from, the research team utilised the student postal contact details to administer the survey.

The margin of error associated with each strata sample was also calculated. The margin of error is a measure of the amount of random sampling in a survey's results. The larger the margin of error, the less confidence one should have that the survey's reported results are close to the 'true' or actual results: that is, the figures for the whole population. The margin of error by sector in the survey sample is shown in Table 2.2 below.

T 2.2 TABLE 2.2
SAMPLE SIZE ANALYSIS

Sector	Target Sample Size	Total Department Sample Population	Confidence Level	Response Distribution	Margin of Error
PTE	3,690	6,410	95%	50%	1.05
Secondary	1,800	2,322	95%	50%	1.10
Tertiary	4,410	16,419	95%	50%	1.26
TOTAL	9,900	25,151	95%	50%	0.77

QUALITY ASSURANCE ANALYSIS ON THE DEPARTMENT SAMPLE

Deloitte and the Ministry spent considerable effort prior to administering the survey, stratifying the sample by region, age and ethnicity. The sample was extensively compared to 2006 Ministry of Education enrolment statistics. The objective was to ensure that the random sample drawn from the Department database was reflective of the wider New Zealand international student population. This analysis was undertaken to provide the Ministry with greater confidence that the Department database could be effectively used for the administration of the live survey. The results of the stratification process for region and country of origin are outlined in the tables below.

REGIONAL BREAKDOWN

The regional breakdown figures (Table 2.3) indicate that the Department database was able to provide a representative sample of students from across New Zealand, ensuring that the final random sample drawn would not be biased in any one regional area.

T 2.3 TABLE 2.3
REGIONAL BREAKDOWN OF DATA

Regional Location	Ministry Enrolment Data	The Department Database			
	All Sectors	University	ITP	PTE	Secondary Schools
Auckland	51%	45%	47%	74%	45%
Waikato	7%	10%	13%	1%	7%
Manawatu	4%	5%	0%	3%	3%
Wellington	14%	15%	6%	2%	5%
Canterbury	16%	16%	20%	11%	20%
Otago	6%	8%	4%	0%	4%
Total (%)	98%	90%	91%	84%	99%

COUNTRY OF ORIGIN BREAKDOWN

It is important to note that for the country of origin breakdown there were areas where small anomalies existed. In particular, this related directly to Japanese student numbers in the Department's PTE / ELS sample and Chinese student numbers in the PTE / ELS and ITP random samples drawn.

T 2.4

TABLE 2.4
COUNTRY OF ORIGIN BREAKDOWN OF DATA

	Ministry Enrolment Data		The Department Database		Random Sample Drawn	
PTE / ELS						
China	11,879	27%	4,631	42%	1,837	50%
South Korea	6,552	15%	1,809	17%	526	14%
Japan	9,944	22%	892	8%	168	5%
Thailand	1,483	3%	361	3%	68	3%
Taiwan	1,810	4%	320	3%	124	3%
ITP						
China	4,973	46%	2,081	49%	752	60%
South Korea	863	8%	302	7%	71	6%
Japan	874	8%	179	4%	42	3%
Thailand	170	2%	80	2%	28	2%
Taiwan	120	1%	67	2%	15	1%
University						
China	13,386	55%	8,116	44%	1,837	58%
South Korea	1,144	5%	942	5%	146	5%
Japan	1,115	5%	490	3%	84	3%
Thailand	355	1%	322	2%	57	3%
Taiwan	409	2%	319	2%	42	1%
Schools						
China	1,666	12%	718	8%	182	10%
South Korea	6,507	47%	2,570	27%	766	43%
Japan	2,000	14%	1,342	14%	209	11%
Thailand	887	6%	609	6%	144	8%
Taiwan	394	3%	260	3%	99	6%

Specifically Table 2.4 shows the lower proportion of Japanese students represented in the Department PTE / ELS sample (8% in contrast to 22% as per Ministry enrolment figures) and the higher proportion of Chinese students represented in the Department's PTE / ELS sample (42% in contrast to 27% as per Ministry enrolment figures). As shown in the final column the final random sample had the potential to create small biases in each of these areas. However, overall these sampling biases did not impact negatively on the final response gathered. See Table 3.0 for the country of origin breakdown by sector.

SUMMARY OF FINAL RANDOM SAMPLE

1. PTE / ELS Sector – random selection of 3,690 students from a total sample of 6,410 international students (1,845 with email contact details, 1,845 with postal contact details).
2. Secondary School Sector – random selection of 1,800 students from a total sample of 2,322 international students (900 with email contact details, 900 with postal contact details).
3. Tertiary Sector – random selection of 4,410 students (3,060 university students, 1,170 ITP students and 180 other tertiary providers) from a total sample of 16,419 international students (all with email contact details).

QUESTIONNAIRE DEVELOPMENT

The original 2003 survey was designed by Professor Colleen Ward from Victoria University with some amendments made by BRC Marketing and Social Research throughout the piloting period.

The development of the 2007 survey was undertaken with the guidance of an Advisory Group comprising representatives from the Ministry of Education, Education New Zealand, the Department of Labour and Waikato University. The process entailed:

- a review of the 2003 survey questions and feedback from Ministry of Education representatives on their satisfaction with various aspects of the survey; and
- re-drafting of 32 existing questions within the survey (this included small wording changes), adding 9 new questions to the survey, and deleting 6 questions.

PILOTING

Prior to administering the National Survey to international students, three pilot phases were undertaken to ensure that the survey questions would be clearly understood by participating students. Piloting was conducted initially for the English language version of the survey, then the translated versions of the survey and finally the online version of the survey. The staged piloting approach provided the research team the opportunity to thoroughly test and re-test how the survey questions could be interpreted in the field by a variety of international students and with different survey instruments.

ENGLISH PILOT

The piloting of the English version of the National Survey was completed between the 29th of January and the 12th of February 2007. In total 22 surveys were piloted (4 secondary school students; 5 Private Training Establishment students; 4 English Language School students; 9 tertiary students). This was an opportunity to test the modified and new questions.

The key outcomes from the English pilot were:

- The survey was perceived by the majority of students to be too long (i.e. the comprehensive nature of the survey meant that it took over 30 minutes for international students to complete);
- Question 43 was amended. If students ticked 'I did not use an agent', they needed to be directed to Question 46;
- Question 28 was amended. The question asked students to calculate how much they spend on accommodation and living expenses. This proved difficult for students to complete. Rather than have this as an open question, six categories were created ranging from $0 – $100 to $500+;
- Questions 59 & 60 were amended. Students commented that these questions required a 'Not Applicable' option, the rationale being that if students had not experienced a specific service / activity then they could not comment on its perceived quality; and
- Questions 56 and 58 were identified by students as difficult to answer.

TRANSLATION

The New Zealand Translation Centre (NZTC) was contracted to back translate the survey into Korean, Japanese and Chinese (simplified) versions and to proofread the online survey versions to ensure all wording had been transferred correctly into the online surveys.

During the piloting of the non-English survey, a small number of areas were identified as potentially problematic, and these were discussed where possible in follow-up interviews undertaken by the research team with student respondents and with the NZTC translators. Further changes were

made to the survey, and Deloitte and NZTC worked together to ensure the translation meaning was consistent across all versions of the survey.

As a result of the extensive consultation, pilot testing, back translation and tests for linguistic equivalence, the research team was satisfied that a relevant, reliable and valid research instrument had been developed.

NON-ENGLISH PILOT

The piloting of the non-English versions of the National Survey was completed between the 12th and 29th of March 2007.

In total 46 non-English surveys were piloted by 12 Korean students, 14 Chinese students and 20 Japanese students (16 secondary school students; 8 Private Training Establishment students; 8 English Language School students; 14 tertiary students).

The key outcomes from the Non English pilots were:

- small translation errors were found in all language surveys, which were reviewed and corrected by NZTC;
- students commented that the survey asked too many questions;
- students found Question 58 confusing to answer. Phrases such as 'important things' were regarded as ambiguous. Students who noted the heading of section H in the survey – 'Life in New Zealand' – asked if Question 58 was referring to their life while in New Zealand or life in general; and
- a number of questions were perceived to be very similar – Questions 59 and Question 60.

ONLINE PILOT

In 2007, the Ministry requested that a pilot and evaluation of an online survey based on the full questionnaire (English and translations) be completed. The purpose of the pilot was to analyse the practicalities of using an electronic survey methodology, allowing the Ministry to determine whether an online survey should be adopted or whether a postal survey should be used.

In light of this request, an online pilot was conducted between the 19th of April and 11th of May 2007.

The Department randomly drew a sample of 334 students. The final sample for the pilot comprised 148 tertiary students, 108 university students, 40 ITP students, 124 PTE / ELS students, and 62 secondary school students. In total 68 students completed the online pilot.

ONLINE PILOT RESULTS

The online pilot worked very effectively. As was anticipated a small number of errors were found in the Department contact database. A total of 41 email addresses identified in the Department database failed to reach the designated mailbox, reducing the total sample to 293.

A further 36 email addresses identified in the Department database were omitted as they were agent or generic institution addresses (i.e. info@...; enrol@...), reducing the total sample to 257. This provided the research team with valuable insight insofar as it identified that further cleansing of the Department's database was needed before a random sample could be drawn – for exmple, filtering was required to ensure that agents and institutions did not receive requests for the National Survey.

After removal of students with invalid, generic or 'care-of' mailbox addresses, a total of 257 students were invited as participants in an online pilot. Sixty-eight students completed the pilot. The key findings were:

Response Time – The short response time is one of the greatest advantages of the online survey. The online survey allows messages to be delivered instantly to recipients, irrespective of the type of educational provider and / or geographical location.

Control of Sample – The online data collection tool and the Department database provided the research team with greater control over the sampling process. In 2003 the random sampling was largely undertaken by education providers and the researchers had minimal control over whether or not a truly random sample was drawn in all instances. Mostly, the previous research team had to work through providers to gain permission to survey students. Use of the Department's database ensured instant and easy access to the required stratified sub-samples of the population, irrespective of their geographical location, and allowed a random sample to be easily drawn.

Data Quality – Students were able to navigate electronically to the next question based on their response to prior questions. Overall it is believed this improved data quality. Schaefer and Dillman (1998) concluded that the quality of data gathered via online tools is better than that gathered via mail surveys. Schaefer and Dillman (1998) compared the quality of data collected via either email or postal mail. They concluded that email surveys provide more detailed and comprehensive information than mail surveys. The 2003 survey was paper-based and the main contact process was via mail, while the 2007 survey was largely conducted online, although all students had the opportunity to complete a paper-based survey. The hypothesis that email and web-based surveys provide more complete information is supported by research conducted independently by different authors (Mehta and Sivadas 1995; Bachman et al. 1996; Stanton 1998). For this reason and as a result of the online pilot it was decided to administer the 2007 survey using online means.

2.2 SURVEY ADMINISTRATION

ONLINE ADMINISTRATION

The online administration of the National Survey commenced on 21 July 2007 and closed on 1 October 2007.

POSTAL & PROVIDER ADMINISTRATION

The postal administration of the survey commenced in early August. Students were sent an introductory letter outlining the purpose and objectives of the research and a hard copy of the research questionnaire. Chinese, Japanese and Korean students were sent a research questionnaire in their national language and all other nationalities were sent an English version of the questionnaire.

To assist with response rates in the PTE / ELS and secondary school sectors, the research team contacted providers directly to solicit their assistance in administering the survey.

Providers who agreed to participate in the research were sent a short letter reiterating the prior discussions about the research process (i.e. the purpose of the research, its objectives, the importance of random sampling), a mixture of English and non-English survey forms to distribute to their students, and freepost envelopes to return the participation consent forms to Deloitte.

Prior to being sent the surveys, providers had agreed to the number of international students they would sample. Similar to 2003, the approach was taken to adopt a simple sliding scale procedure based on the number of international students at the institution in question (e.g. those with 250 students were asked to sample every third student whereas those with only 60 were asked to sample every second).

Providers who declined to take part in the research were asked why they did not wish to be involved. Reasons given included:

- lack of time available to commit to administering the survey;
- students had already been surveyed by other researchers recently;
- the Ministry survey was too comprehensive and long to be easily administered to students;
- dissatisfaction with the Ministry or other government-funded education bodies; and
- research was 'a waste of time'.

2.3 SURVEY RESPONSES

In total 2,677 international students completed surveys by the closing date. This represents a response rate of 30% from the total number of survey invites sent to students.

The response rates are outlined in Table 2.5 below:

T 2.5 TABLE 2.5
FINAL RESPONSE RATE

Sector	Emails Sent Out to Students to Complete	Postal Surveys Sent to Students to Complete	Postal Surveys Sent to Institutions to Administer	Total Survey Invites Sent Out	Non Contacts	Total Response	Response Rate
PTE	2,540	600	327	3,467	223	659	19%
Secondary	675	398	369	1,442	358	467	32%
University	2,975	0	0	2,975	265	1136	38%
ITP	1,060	0	0	1,060	110	415	39%
TOTAL	7,250	998	696	8,944	956	2,677	30%

Note: The numbers take into consideration the email and postal failures received during the administration period

Participation rates varied across sectors. The response rate was the highest amongst ITP students. The response rate from the tertiary sector (universities and ITPs) was particularly strong and represented a significant increase over the 2003 survey participants.

2.4 LIMITATIONS

The principal aim of any sampling procedure is to obtain a sample which, subject to limitations of size, will reproduce the characteristics of the population being studied, especially those of immediate interest, as closely as possible. The 2007 sample was largely reflective of the overall international student population in New Zealand; however, as outlined in Table 2.4 the Department database did produce higher than desired numbers of Chinese students in the PTE sector.

The maximum margin of error for the total 2007 sample is ± 1.87% at the 95% confidence level and ± 2.46 at the 99% confidence level. Therefore, for example, if 47% percent of the survey sample stated that 'speed of teaching' was about right, we can be confident that if we had asked the question of the entire relevant population, between 45% (47 - 1.87) and 49% (47 + 1.87) would have chosen that answer.

2.5 ANALYSIS

The 2007 research response rate and pattern yielded a robust and representative sample of international students in New Zealand. A slightly lower than targeted number of student responses came from the PTE and ELS sector.

However, the overall composition and proportion of responses across each individual sector was well balanced, with 17.4% of responses coming from secondary school students, 42.4% from university students, 24.6% from PTE / ELS students and 15.5% from ITP students. In light of this, no weighting was applied to any data in the analysis. Thus the figures presented represent the raw 'true' figures of the sample gathered.

STATISTICAL ANALYSIS

When reading the descriptive research results in Chapter 4, the term 'statistically significant' is used where the effect, relationship, or difference measured is highly unlikely to occur by chance.

Differences that are statistically significant across the different sub-groups (i.e. sector, country of origin, depth markets, regional and gender) are significant at the conventionally used 95% confidence level ($p < .05$). This means that in these instances there is at least a 95% likelihood that the difference did not happen by chance. One-way analysis of variance and chi square procedures were run to test for the statistical mean differences where mean data is available.

2003 WEIGHTED VS UNWEIGHTED DATA

The 2003 response rate did not yield a representative sample of international students in New Zealand. Secondary students were highly over-represented and private language students and tertiary students were under-represented. In order to circumvent some of the difficulties arising from a sample biased in this way, data in 2003 was weighted by provider type.

In 2007, the research response rate and pattern yield a much more representative sample of the international student population in New Zealand. As a consequence it was not deemed necessary to weight the data as in 2003. The comparisons of 2007 data (e.g. by sector, region, country of origin and gender) and 2007 and 2003 data at a group level are based on unweighted data. However, entire sample comparisons between 2007 and 2003 present unweighted (2007) and weighted data (2003) data. The statistical analysis was performed only on unweighted data.

Therefore, where comparisons are made between the entire samples of 2007 and 2003 data, the analysis is descriptive only, providing a broad indication of where changes have occurred in specific areas and specific items of interest.

However, where comparisons of 2007 and 2003 data are made between the group levels (i.e. by sector, country of origin), the analysis presents statistically tested comparisons.

CLEANING / CHECKING & AUDITING OF DATA

Once all survey responses were aggregated into a statistical database, a cleaning, checking and data audit process was undertaken to ensure that any data input errors were detected and corrected. This process involved checking irregularities such as multiple responses to single-response questions, inconsistent responses, skips not being followed correctly, unclear responses, data input error on scale questions and coding non-responses as '9' or '99' where appropriate.

Once the database was cleaned and validated, the data provided by the translators was merged into the Statistical Package for the Social Sciences (SPSS) database.

MISSING DATA ANALYSIS

The impact of missing data typically results in a loss of statistical power due to a reduction in effective sample size. In 2007, the missing data was controlled by the following procedure. Cases were coded as 99 or 9 when missing and then deleted / ignored in the analysis. This resulted in a reduction in the number of respondents answering specific survey questions. Thus, for individual question analysis the population sizes will vary depending on the proportion of missing data.