NEW ZEALAND SURVEY ON COLLEGIATE ENTREPRENEURSHIP 2006

PERCEIVED BARRIERS AND NEEDS BY ENTREPRENEURIAL UNIVERSITY STUDENTS IN NEW ZEALAND

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EXECUTIVE SUMMARY

This study into tertiary students' perceived barriers and motivations to become an entrepreneur is part of an international study which has been conducted in 13 other countries. The current report details the findings of 7970 filled questionnaires from Otago and Canterbury University. At the time of printing this report, at least the sample for Otago University could be ascertained as being representative of all students at Otago.

Entrepreneurship means having a certain poise, an attitude, a way of taking risks when making business decisions. For New Zealand, entrepreneurs are a vital force that creates employment and wealth. Universities are increasingly asked to contribute to the growth and success of entrepreneurship by equipping students with the right skills, by encouraging and teaching quality planning, as well as sustainable design and execution. To be prepared for these functions, the current study was conducted to equip us with the knowledge of who these entrepreneurs are, what they are studying, and what they need. This report shows that New Zealand Universities can become a key-driver in fostering entrepreneurship across *all* its subject areas.

FINDINGS:

1. Altogether **37% of students at Otago and Canterbury Universities aspire to becoming entrepreneurs.** (This result is amongst the highest compared to all other countries studied (ICSE 2006), corroborating previous findings.)[1]

2. **Industries targeted by entrepreneurial students** are wholesale/retail, public, business and hospitality services and, to a smaller extent, cluster around the food and clothing sectors.

3. Intentions of becoming an entrepreneur are distributed rather equally across all university subject areas with the predictable exception of business students who have the highest tendency.

4. Notably, **medical and pharmaceutical students** show strong entrepreneurial ambitions. However, they have taken significantly **fewer steps towards planning for self-employment** than business students. No other student group differs from either of these. It is encouraging that there is thus an equal distribution of planning stages for entrepreneurship across the universities.

5. **Natural Science subjects** have the highest percentage of students who have *never* thought of becoming self-employed (79.3%).

6. **The likelihood of becoming an entrepreneur** is far higher for those from families with entrepreneurial background than from those without such background.

7. **The hurdles when becoming entrepreneurs** are mainly seen in financial risks and the perceived lack of 'the right business idea'.
   Prevalent amongst New Zealand students is a lack of knowledge and skills in
   a. market research and product testing
   b. understanding market conditions business and economic cycles
   c. business skills, particularly amongst those less committed.

8. **Personality characteristics of entrepreneurial students** indicate that they see themselves as,
   a. not very compatible with others
   b. more extroverted
   c. emotionally more robust
   d. less conscientious and diligent than they would like to be
   e. requiring more teamwork-skills as a corollary to their higher leadership skills
   f. having more and better business skills than those less committed to self-employment and holding strong desires to expand and hone these
   g. more creative and more appreciative of hard work than those lesser committed to self-employment.

9. The offering of business and entrepreneurial classes at universities has been judged as 'rather good' on average. However, only 17% of students have visited these while 8.2% even maintained that these are not offered.

1 (see Minniti, Bygrave and Erkko, 2005; T. Volery, H. Bergmann, G. Haour und B. Leleux , 2006).

RECOMMENDATIONS:

Universities are well-placed to assist in the development of entrepreneurship i.e. to help those students with entrepreneurial intentions to find and use appropriate facilities and resources. These need to be accessible, didactic and publicised.

Entrepreneurs at differing stages of commitment and planning ask for targeted assistance. **Business games that simulate decision-making processes are particularly needed** at early stages of commitment while **personal contact** points and **mentoring systems are perceived important at later stages. Symposia** are important for those already running a business.

To boost entrepreneurship, **publicise better and offer suitable entrepreneurial skills classes** that can be recognised as valuable by students from different subject areas. In particular, consider opening up or easing access to market research and product development classes.

Encourage university staff, when teaching, to **use more examples of entrepreneurship in their subject** areas so as to also encourage thoughts about the commercial applicability of skills and knowledge taught. This suggestion should particularly be considered in the natural sciences.

Organise more efficient and better structured relationships between Business Schools and industry for mentoring and job-experience opportunities.

Keep monitoring entrepreneurship and needs at tertiary institutions (the next international survey is planned for 2008).

PERCEIVED BARRIERS AND NEEDS BY ENTREPRENEURIAL UNIVERSITY STUDENTS IN NEW ZEALAND

INTRODUCTION

Entrepreneurship is a vital force in the generation of a nation's wealth. It relates to the style, motivation, energy or drive of individuals to make a living as a self-employed person. While entrepreneurs can be found anywhere, in businesses great and small, they can particularly be found in small and medium sized enterprises as this often suits their personality and aspirations better of achieving by and for themselves.

In New Zealand, SMEs offer almost half of all employment to the working population and generate 39% of GDP. With 257,000 businesses, they account for 96% of all enterprises (MED, 2006). "It is their numbers that make them important to the Economy, but it is their potential for growth, that makes them vital to the economic transformation agenda" (Lianne Dalzel, 2006).

Universities have become an attractive source and resource for entrepreneurship. This is because of the justified expectation that higher levels of education can create higher quality of entrepreneurship and productive power. In turn, improved knowledge and skills are a prerequisite for further growth.

Increasingly, universities are asked to provide evidence for their contribution to society and, amongst other things, to the economic wealth of nations. It is therefore of interest as to what assistance universities could offer to help create and assist entrepreneurs. Put another way, what are the barriers, needs and motivations perceived by potential and actual entrepreneurs? What are potential ways universities can assist entrepreneurs? The present report attempts to provide some answers to these and related questions.

The report is based on a survey which covers a range of question pertinent to understanding entrepreneurial drives as well as perceived needs. Apart from demographic information (age, gender, course and state of study at university), the survey also asked for perceived barriers to become an entrepreneur, personality characteristics, goals in life, aspired career in terms of the type of business targeted, and previous experience with entrepreneurship.

The report can also be read in conjunction with the overall ICSE 2006 report (Fueglistaller et al, 2006). The latter contains comparisons of findings across universities from 14 countries (sample size = 37,412 students). As has been confirmed there and in other studies (e.g. Minitti, 2005), New Zealand ranks amongst the most entrepreneurial countries, even amongst students.

METHODOLOGY

The study presented here involves a survey that had been administered to universities in 14 countries. Here we present the New Zealand results only. The survey used a web-based format and has been administered by St Gallen University, Research Institute of Small and Medium Enterprises. Previous versions of the survey had been tested in Germany and Switzerland. This is the first time it is tested in an English environment. It is planned to be repeated bi-annually.

The survey had been administered between the beginning of March and the end of May in 2006. In New Zealand, there are 7 major Universities and a number of other tertiary institutions such as Polytechnics. Only these universities were included in the first instance. The two largest from both the North and South Island were chosen for their breadth of subject areas. They were asked to send an invitation to students via the university's student server. The universities in the North Island declined participation, however. In one instance because of commitments to other, ongoing surveys taking place. In the other because of apparent ethical reasons relating to the perception that students might feel 'spammed', i.e. bombarded with unsolicited e-mail.

In the end, only two universities from the South Island participated. Students were offered attractive lottery prizes for filling in the questionnaire. The data were processed in SPSS, a computer based statistical package used for cleaning, collapsing and analysing the data. Further detail on the methodology as well as the representativeness of the survey can be found in chapter 7 at the end of this report.

1. SAMPLE DESCRIPTION

The sample (n= 7970) for the Entrepreneurship survey was taken from two universities in New Zealand, the University of Otago (n= 4298; population 15 452; return rate = 28%) and the Christchurch University (n= 3661; population 11.901; return rate = 31%), both situated in the South Island. The total sample was comprised of 47% males and 53% females[2].

Table 1. Gender Distribution

	Quantity	Percent
Male	3,726	46,8%
Female	4,244	53,2%
Total	**7,970**	**100%**

Students' ethnic origin is mainly Pakeha/European and New Zealanders (73.8%) with 2.4% identifying as Māori and 13.7% as Asian (See Table 2). Asking for students' mother tongue showed that 80.6% have an English speaking background while 20% share a wide variety of cultural backgrounds. The largest international contingent is Chinese (8.1%), followed by 1.4% Germans. A further 8.2% represent many other cultural backgrounds not tabled here including Pacific Islanders, Indians, Ukrainians and Afghanis (see Table 3).

Table 2. Ethnic Background

	Quantity	Percent
Māori	193	2.4%
Pakeha/European	2,1472	6.9%
New Zealander	3,738	46.9%
Asian	1,093	13.7%
Other	799	10.0%
Total	**7,970**	**100%**

Table 3. Mother Tongue

	Quantity	Percent
German	114	1.4%
French	38	0.5%
Italian	7	0.1%
English	6,421	80.6%
Finnish	5	0.1%
Norwegian	7	0.1%
Hungarian	4	0.1%
Chinese	648	8.1%
Turkish	4	0.1%
Croatian	3	0.0%
Spanish	16	0.2%
Arabian	46	0.6%
Other	657	8.2%
Total	**7,970**	**100%**

2 *Indeed, at least for the University of Otago, the results are highly representative. An analysis of respondent numbers by subject area studied shows that the sample replicates the population in good detail. See the last page of this report. The actual numbers for Canterbury University could not be ascertained in time for this report.*

Table 4 shows the year of study with between 20-25% of students in their Bachelor years, some 15% in their fourth, and 14% in their fifth year. When asking for the level of study (not tabled here), results show that many 4th year students are pursuing double degrees as a total of 80% of all students are still in their Undergraduate years, while 11.5% are Graduate students (n=908) and 4.5% are PhD students (n= 361). 94% of the sample is full time and the other 6% are part time students.

Table 4. Year of Study

	Quantity	Total Percent	Cumulative Percent
1st academic year	1,810	2.7%	22.7%
2nd academic year	1,768	22.2%	44.9%
3rd academic year	2,020	25.3%	70.3%
4th academic year	1,259	15.8%	86.1%
5th and further academic year	1,108	13.9%	100%
Total	7,965	99.9%	
Missing	5	0.1%	

The **average age** of participants is 22.8 years (median and mode 21), or 80% are 24 years or younger, some 10% are between 25 and 30 years of age while another 10% is older than 30.

The range of subjects studied is wide. There are only a few differences between the two universities in terms of relative percentages of students studying in the various fields, as Canterbury specializes in engineering (21% vs. 1.1% at Otago) whereas Otago has a major medical school (23% vs. 1.4% at Canterbury) and is also prominent in Sports/ Physical Education (4% vs. 0.4% at Canterbury). The distribution across the sample in Table 5 is for both universities. The classification of subject areas follows European standards.

Table 5. Field of study students are majoring in / pursue Ph.D.

Field	Quantity	Percentage
Economics	487	6.1%
Business administration	885	11.1%
Business information Systems	352	4.4%
Law	733	9.2%
Mathematical sciences (Math, physics, info systems, astronomy)	458	5.7%
Natural sciences (chemistry, biology, geology, geography)	1,069	13.4%
Medical sciences and pharmaceutics	1,031	12.9%
Civil engineering, architecture	325	4.1%
Mechanical and electrical engineering	478	6.0%
Agricultural and forestry science	36	0.5%
Theology	32	0.4%
Philology and literary studies	202	2.5%
Science of history and cultural studies	305	3.8%
Social sciences (psychology, sociology etc.)	1,380	17.3%
Sports	193	2.4%
Military sciences	4	0.1%
Total	7,970	100%

2. INTEREST AND BARRIERS TO ENTREPRENEURSHIP

2.1. INTEREST IN ENTREPRENEURSHIP

In terms of interest in entrepreneurship, two survey questions are of importance. Firstly, there is students' involvement with the concept of Entrepreneurship (see Table 6.1) and secondly, their aspirations as to where they see themselves employed.

The latter is split into presenting the industries targeted by future entrepreneurs with past experience (see Table 6.2), and those without experience but with a strong commitment to becoming entrepreneurs.

Results to the second question (what type of employment students seek) is presented in the form of a) aspirations within 5 years after finishing their studies at university and b) where they see themselves employed *after* the first 5 years (see Table7).

Table 6.1. Have you personally, ever concretely thought of building up your own self-employed entrepreneurial existence?

Commitment to Entrepreneurship Scale (1-3 and 5-7)*		Quantity	Percent
1	No, never	1,682	21.1%
2	Yes, sketchily	3,683	46.2%
3	Yes, rather concretely	938	11.8%
4	*Yes, but I turned away from it*	428	5.4%
5	Yes, I am bound and determined to work self-employed	719	9.0%
6	Yes, I already started with the realisation	260	3.3%
7	Yes, I am already self-employed	127	1.6%
8	*Yes, I was self-employed, but no longer am*	133	1.7%
Total		7,970	100%

** Apart from categories 4 and 8 in Table 6.1, the sequence of categories indicates an increase in intensity of thinking about becoming an entrepreneur. This sequence of categories will henceforth be referred to as the 'Commitment to Entrepreneurship' or 'E-Commitment' scale.*

2.2. INDUSTRIES TARGETED BY ENTREPRENEURIAL STUDENTS

Table 6.1 shows that 21% have never thought about becoming entrepreneurs while almost 50% have at least toyed with the idea. Some 33%, however, have had serious thoughts about stepping out and becoming self-employed and/or have already had experience as entrepreneurs.

Table 6.2 shows in which industries the majority of those who want to start up their business wish to locate themselves. It can be noted that the majority seeks opportunities in trade and the (public) services industries as opposed to product and manufacturing sectors.

Table 6.2. Chosen Industries of Future Entrepreneurs with Past Experience

	Have you personally ever concretely thought about building up your own self-employed entrepreneurial existence, i.e. being self-employed?		
In which industry have you or are you planning to start up your business?	yes, I am already self-employed	yes, I was self-employed, but no longer am	Total
Agriculture, hunting, forestry and fishing	7	9	16
Mining	0	1	1
Production of food products, beverages and tobacco	2	7	9
Production of textiles, textile products, leather and footwear	3	1	4
Production of wood and products of wood and cork	2	1	3
Production of pulp, paper, paper products, printing and publishing	2	1	3
Production of chemical, rubber, plastics and fuel products	0	3	3
Production of other non-metallic mineral products	1	0	1
Production of basic metals and fabricated metal products	0	1	1
Production of machinery and equipment	1	1	2
Production of manufacturing NEC, recycling	1	1	2
Electricity, gas and water supply	1	0	1
Construction	3	5	8
Wholesale and retail trade	14	8	22
Restaurants and hotels	7	8	15
Transport and storage	6	0	6
Communication	21	13	34
Finance, insurance, real estate	8	3	11
Business services	20	21	41
Public admin. and defence; compulsory social security	0	2	2
Education	4	13	17
Health and social work	6	12	18
Other community, social and personal services	17	22	39
Total	126	133	259

A further analysis (not tabled here) sought to find out where those with entrepreneurial experience may have gained inspiration, i.e. whether at university or outside of it.

Of those who state that they have actual experience in self-employment (ticked boxes 7 and 8 in Table 6.1 (n=260)), 75 have had no experience in their chosen future career, whereas 184 have had some experience before. This means that about 30% of those with entrepreneurial experience are seeking new horizons going beyond their past entrepreneurial or work experience, while 70% will be building on previous experiences. It thus appears that the majority of students with entrepreneurial experience use the university to further themselves but received their inspiration outside or prior to studying.

All other students who show interest and commitment to entrepreneurship show less confidence and are envisaging more hurdles (see Table 9). Universities are well placed to help lower these hurdles by preparing and targeting didactic courses.

These findings could suggest that universities and their respective incubators and business schools may add to an increase in entrepreneurship amongst students if inspirational stimuli to this end could be provided including in class and lecture rooms (speakers, presentations, events etc.).

2.3 TYPE OF EMPLOYMENT SOUGHT AFTER STUDYING

The trend indicated in the above table (6.2) continues for those with as yet no experience as entrepreneurs but a willingness of becoming self-employed. Table 6.3 shows the industries chosen by those who ticked boxes 5 and 6 in Table 6.1. (those who are determined and those who have started the realisation of their businesses). The majority see their future in wholesale/retail and in the services industries with another; smaller cluster in the food and clothing production sectors.

Returning to the total sample, Table 7 shows the type of employment students seek a) within the first five years after studies and b) in the years beyond. This is of interest as many students expressed their willingness to gain practical experience first before striving for self-employment.

There are roughly five subgroups in Table 7, those who seek employment by micro firms, SMEs or corporations (1-6) we call here 'Other Employed', those striving for careers in public service including at university (7 & 8) named 'Public or Uni Service', and those who seek various forms of self employment (9-13) henceforth called 'Self-Employed'. Further, there are those who wish to start families as their main goals for the time horizons given, and those who do not yet know what their career will involve.

Table 6.3. Chosen Industries of Future Entrepreneurs without Past Experience

In which industry have you or are you planning to start up your business?	Extent of E-Ship		
	Bound & Determined	Already Started	Total
Agriculture, hunting, forestry and fishing	27	10	37
Mining	4	2	6
Production of food products, beverages and tobacco	22	16	38
Production of textiles, textile products, leather and footwear	12	12	24
Production of wood and products of wood and cork	2	5	7
Production of pulp, paper, paper products, printing and publishing	6	2	8
Production of chemical, rubber, plastics and fuel products	9	7	16
Production of other non-metallic mineral products	1	1	2
Production of basic metals and fabricated metal products	7	3	10
Production of machinery and equipment	15	5	20
Production of transport equipment	3	2	5
Production of manufacturing NEC, recycling	2	2	4
Electricity, gas and water supply	9	7	16
Construction	18	4	22
Wholesale and retail trade	79	32	111
Restaurants and hotels	69	21	90
Transport and storage	5	3	8
Communication	40	22	62
Finance, insurance, real estate	56	17	73
Business services	95	22	117
Public admin. and defence; compulsory social security	14	3	17
Education	29	14	43
Health and social work	113	23	136
Other community, social and personal services	79	23	102
Total	716	258	974

While there is some 40% agreement between the careers chosen from one time period to the next (r = . 376; p< .001), an inspection of the columns in Table 7 reveals that there is a clear trend from other-employment to self-employment *after* 5 years from leaving university. In other words, while 47% seek paid (or 'other') employment within the first 5 years after leaving university, only 23% see themselves in an employee relationship after that time. Correspondingly, while some 13% of all students see themselves as entrepreneurs right after finishing their degree, the number grows to 37% after 5 years.

Table 7. Which principal / main activity are you striving for after your studies?

	Main activity directly after studies (<5 Years)		Main activity five years after studies (>5 Years)	
	Quantity	Percent	Quantity	Percent
1) Paid employment at a micro enterprise	411	5.2%	208	2.6%
2) Paid employment at a small enterprise	1,017	12.8%	421	5.3%
3) Paid employment at a medium-sized enterprise	1,287	16.1%	475	6.0%
4) Paid employment at a big company	995	12.5%	706	8.9%
5) Paid employment as a researcher at a university/ college	551	6.9%	392	4.9%
6) Paid employment in civil / public service	756	9.5%	422	5.3%
7) Self employment getting in the family business	171	2.1%	185	2.3%
8) Self employment taking over an existing business	98	1.2%	263	3.3%
9) Self employment starting-up a franchise business	71	0.9%	213	2.7%
10) Self employment investing into an existing company	139	1.7%	357	4.5%
11) Self employment in your already founded start-up	102	1.3%	163	2.0%
12) Self employment starting up a business	268	3.4%	1,213	15.2%
13) Self employment working as self-employed person	154	1.9%	589	7.4%
14) Founding a family as main activity	322	4.0%	859	10.8%
15) Don't know yet	1,628	20.4%	1,504	18.9%
Total	7,970	100%	7,970	100%

It is interesting to note here that there is no significant difference in the degree of intentions of becoming entrepreneur after 5 years between business students and those studying other disciplines. This raises the questions a) would these students differ in terms of steps taken towards self-employment and b) in terms of the type of help they would like to receive when establishing a business?

2.4 CONCRETE STEPS TAKEN TOWARDS FOUNDING A BUSINESS

The following Table 8 shows the steps one needs to take when founding a business. If we apply a sense of realism as to which step is appropriate at what time, the sequence reflects an increase in intensity of commitment to entrepreneurship.

The results of the descriptive Table 8 reflects what one would expect from the numbers of those who have thought about becoming an entrepreneur (see Table 6.1) and the previous Table 7 which showed what types of employment students were going to seek.

Table 8. Which steps did you already take for your potential start-up?

Steps Taken Scale*	Quantity	Percentage
No steps taken	2,753	45.2%
Thinking through first business ideas	2,886	47.4%
Writing down first business ideas	1,181	19.4%
Developing a business plan	670	11.0%
Gathering start-up specific information	734	12.1%
Visiting start-up specific events	372	6.1%
Talking to potential sources of financing	353	5.8%
Determining a date of foundation	137	2.3%
Prototype of product/service exists	314	5.2%
Total	6,087	154.4%

** Students could tick these categories according to what they had already done towards founding a business. The closer they were to founding a business, the more they would have done. In this way, the categorical scale was transformed into a ratio scale, by simply adding the categories together for each respondent.*

When correlating Table 8 above with Table 6.1 (Commitment to Entrepreneurship or E-Commitment; see footnote Table 6.1) the expectation that, the more students are committed to entrepreneurship, the more steps they would have taken is corroborated by a fairly strong correlation (Spearman's rho = .380, $p<.000$; Pearson's $r= .409$, $p<.000$; $n= 5725$).

Excluding those who are self-employed already, an analysis of variance using the Commitment variable and the Steps Taken variable above results in a highly significant difference between the 6 Committed-to-Entrepreneurship groups on the Steps Taken scale (see footnote Table 8; sig. difference .000, 4df; Chi Square 926.225). This demonstrates the nomological or face-validity of the scale and justifies its further use for comparisons.

In other words, students' answers on the E-Commitment scale (see Table 6.1) reveal not only how intensely students are committed to the idea of becoming entrepreneurs but also indicates the amount of planning for entrepreneurship at each level of E-Commitment. The more committed they are, the more have they initiated steps towards entrepreneurship. This assurance adds to the credibility of the following findings which detail where (aspiring) entrepreneurs see barriers.

2.5 FAMILY BACKGROUND IN ENTREPRENEURSHIP

When comparing those with a family background in entrepreneurship (53% of the sample) with those that had no such experience, there are clear tendencies that more with such background consider self-employed careers themselves.

Table 8.1. Entrepreneurial Commitment compared between those with and those without Family Background in Entrepreneurship

E-Family Background?	Have you personally ever concretely thought about building up your own self-employed entrepreneurial existence, i.e. being self-employed?								
	no, never	yes, sketchily	yes, rather concretely	yes, but I turned away from it	yes, I am bound and determined to work self-employed	yes, I already started with the realisation self-employed	yes, I am already self-employed longer am	yes, I was self-employed, but no	Total
yes	708	1979	522	233	484	159	70	69	4224
no	968	1687	410	192	232	99	56	64	3708
Total	**1676**	**3666**	**932**	**425**	**716**	**258**	**126**	**133**	**7932**

Table 8.1 shows the numbers of students at their various levels of commitment to entrepreneurship and whether they have a family background in self-employment. These groups are significantly different ($p<.000$) with the tendency that proportionately fewer students with family background are less likely of not being committed to becoming entrepreneurs.

3. BARRIERS, MOTIVATIONS AND NEEDS OF ENTREPRENEURS

3.1 BARRIERS TO ENTREPRENEURSHIP

The following Table 9 records students' impression as to where the hurdles lie for becoming entrepreneurs. In a first approach, Table 9 shows the percentages for each category (from "a very small hurdle' to "a very big hurdle').

Table 9. Where do you see the greatest hurdles for starting up a business?

Hurdle		Very small hurdle	Pretty small hurdle	Rather small hurdle	Rather big hurdle	Pretty big hurdle	Very big hurdle	Total
1) lack of the right business-idea	Quantity	427	794	1,364	2,065	1,868	1,452	7,970
	Percent	5.4%	10.0%	17.1%	25.9%	23.4%	18.2%	100%
2) complicated regulatory efforts	Quantity	260	801	2,570	2,811	1,202	326	7,970
	Percent	3.3%	10.1%	32.2%	35.3%	15.1%	4.1%	100%
3) own financial risk	Quantity	236	556	1,256	2,261	2,220	1,441	7,970
	Percent	3.0%	7.0%	15.8%	28.4%	27.9%	18.1%	100%
4) lack of courage	Quantity	580	1,007	1,831	1,950	1,578	1,024	7,970
	Percent	7.3%	12.6%	23.0%	24.5%	19.8%	12.8%	100%
5) lack of the right founding partner	Quantity	391	902	1,875	2,474	1,681	647	7,970
	Percent	4.9%	11.3%	23.5%	31.0%	21.1%	8.1%	100%
6) lack of equity	Quantity	251	627	1,704	2,561	1,803	1,024	7,970
	Percent	3.1%	7.9%	21.4%	32.1%	22.6%	12.8%	100%
7) lack of debt capital	Quantity	221	545	1,667	2,722	1,901	914	7,97
	Percent	2.8%	6.8%	20.9%	34.2%	23.9%	11.5%	100%
8) know-how deficit (eg tax or law issues)	Quantity	300	806	1,849	2,224	1,811	980	7,970
	Percent	3.8%	10.1%	23.2%	27.9%	22.7%	12.3%	100%
9) lack of contact to	Quantity	300	869	1,917	2,119	1,810	955	7,970
	Percent	3.8%	10.9%	24.1%	26.6%	22.7%	12.0%	100%
10) economical cycle clients / customers	Quantity	311	968	2,780	2,433	1,148	330	7,970
	Percent	3.9%	12.1%	34.9%	30.5%	14.4%	4.1%	100%
11) business environment	Quantity	311	989	2,623	2,460	1,219	368	7,970
	Percent	3.9%	12.4%	32.9%	30.9%	15.3%	4.6%	100%
12) fear of failure / economic policy	Quantity	700	1,265	1,771	1,647	1,430	1,157	7,970
	Percent	8.8%	15.9%	22.2%	20.7%	17.9%	14.5%	100%
13) support from family and friends	Quantity	2,210	1,766	1,982	1,085	596	331	7,970
	Percent	27.7%	22.2%	24.9%	13.6%	7.5%	4.2%	100%
14) lack of time	Quantity	628	1,168	1,839	1,980	1,486	869	7,970
	Percent	7.9%	14.7%	23.1%	24.8%	18.6%	10.9%	100%
15) lack of entrepreneurial qualifications / skills	Quantity	596	965	1,766	1,839	1,622	1,182	7,970
	Percent	7.5%	12.1%	22.2%	23.1%	20.4%	14.8%	100%

Studying the above figures, it becomes apparent that *'lack of business ideas and partners'*, as well as *'financial risks'* are perceived major hurdles by all students. A comparison with overseas studies (see Fueglistaller et al, 2006) shows this to be a common result. However, the *'lack of the right business idea'* is less apparent at applied and engineering institutions and subject areas while, in form, *'lack of entrepreneurial skills'* are mentioned more frequently there.

This suggests that universities should try and bring together academically trained students with technically trained students (including those from Polytechnics) to exchange ideas and interests so as to incubate start-ups. This appears justified as some 60% of students mention a lack of suitable business partners as being a substantial hurdle.

In order to recognise any underlying dimensions amongst the above variables, a factor analysis was conducted. A successful factor analysis relies on the correlation between variables. A Principal Component analysis resulted in only two factors (two varimax rotated factors explain 70% of the variance; Chronbach alpha = .63). The first factor, Financial Hurdle, explains 42 % of the variance while the other factor, Support Hurdle, explains 28%. Financial Hurdles comprise lack of debt and equity capital as well as the fear of one's own financial risk. The second factor is that students clearly see the need of family support and a lack of time to conceive of ideas, let alone developing and operationalising good business ideas from concept to market, as related reasons that prevent students from becoming entrepreneur.

An analysis of variance compared students at different levels of commitment (see E-Commitment variable Table 6.1) regarding the above Financial and Support hurdles. No differences could be found. In other words, no matter how committed students are, these are equally perceived hurdles across all groups of E-commitment.

The lack of convergence or a higher number of factors shows a general unrelatedness between the items listed as hurdles. In other words, each hurdle by itself can pose as sufficient reason for a student not to go ahead with entrepreneurial ideas. To gain a deeper insight, each hurdle is analysed individually in relation to levels of commitment. It will indicate what type of encouragement, information or training needs may be involved at each level of entrepreneurial commitment.

3.2 COMPARING LEVELS OF E-COMMITMENT BY PERCEIVED HURDLES IN BECOMING AN ENTREPRENEUR

In a further attempt to separate those with clear ideas as to who or what they want to be in the future, only those who actually have begun to think about entrepreneurship concretely were included in an analysis of the perceived differences of all other hurdles not dealt with in the above factor analysis. In this case, it involved those four groups between category 3 and 6 (please see Table 6.1: 1= Never thought about becoming an Entrepreneur; 2= Thought about it Sketchily; 3= Rather Concretely; 4= Bound & Determined; 5= Already Started to Realise Business Ideas; 6= Self-Employed Already.)

A multivariate analysis of variance controlling for different group sizes resulted in a number of differences between the groups of E-Commitment. All multivariate test indicators show highly significant differences ($p < .000$).

At the (univariate) level of the individual Hurdle (see 1-15 in Table 9), the following differences appeared (all significant differences are <.05). Those who had already started their own business were not worried about having **'the right business idea'** anymore, but the Self-Employed differed significantly from all others ('Bound and Determined' and 'Thought Rather Concretely') but not from those who 'Already Started' to realise their business idea. The Self-Employed and Already Started have clearer ideas about what they are actually going to offer in the marketplace than the 'Bound and Determined' and the 'Rather Concretely'. In turn, the latter aspire to an entrepreneurial existence but are short of *'the right idea'.*

There are no differences between the four E-Commitment groups in terms of any **'lack of contact to clients'.** Some 60% see this at least as 'a rather big hurdle'. In light of previous findings, this result points towards a need for better market knowledge and market research skills by even those who believe that they have the right business idea (correlation between 'lack of contact' and 'right business idea': $r = .4$; $p < .000$). The result points to a lack of knowledge as to how entrepreneurs can actually test ideas for products they would like to introduce to the market.

The ones at the threshold to being E-Committed ('Bound and Determined' and 'Rather Concrete') differ significantly from the Self Employed and those who have Already Started to realize their business in their fear of **'economic cycles'.** Just under 50% of all students see this as at least a 'rather big hurdle' (see Table 9) and it is the Self-Employed and Already Started who are less worried. This may be because they are already engaged whereas the others are rather worried about the timing of entering the market.

Similarly, the Self-Employed differ significantly from those who find themselves still before the stage of business realisation (i.e. the 'Bound and Determined' and 'Rather Concrete') in their perception that the **'business environment / economic policy'** might be a hurdle. The Self-Employed also perceive a **'fear of failure'** significantly less. The Self-Employed are thus more confident and knowledgeable. Conversely, all others appear in need of better introduction of how market conditions do in fact impact start-up decisions.

Lastly, but most importantly, there are substantial differences between the groups' perceptions of their own **'entrepreneurial skills'.** The Self-Employed do not differ from those who have Already Started realising their business ideas. They both see any lack of skills as a 'rather small hurdle' (see Table 9 for these categories). They do differ significantly, however, from the ones who are en-route to commitment, as it were, i.e. the 'Bound & Determined' group. In turn, all of the above groups differ significantly from the 'Rather Concretely' group in their perception of their 'entrepreneurial skills'. The reported levels of commitment to entrepreneurship thus clearly coincide with differing perceived levels of skills.

In summary then, the results give a rather clear picture of what the perceived hurdles to entrepreneurship are. The hurdles differentiating the four E-Committed groups the most are those relating to lack of entrepreneurial skills, market knowledge and market approach.

To determine the relative weight of the most important hurdles, a multinomial regression analysis with 'Fear of failure' as the dependent variable and all other 14 variables of Table 9 as independent variables was conducted. The fear of the *financial risk, lack of courage, business environment, lack of support from family and friends, and entrepreneurial skills* together explained some 53% of the occurring variance. 'Lack of courage' proved to be the by far strongest predictor for this result.

In turn, a further regression analysis with 'lack of courage' as the dependent variable explained 60% of the occurring variance. The reasons standing out for this result were *'lack of the right business idea, 'the right founding partner'* and *'fear of failure'.* The other, lesser reasons were *'ones own financial risk', 'lack of contacts to clients'* and *'lack of entrepreneurial skills'.*

In essence, university students are particularly in need of 'how-to' knowledge; they require to be confronted with functional, procedural and operational examples of SMEs and start-ups. In particular, budding entrepreneurs feel they need access to concepts and mechanisms for product development and testing.

3.3 TYPES OF HELP SOUGHT FOR START-UP

Table 10. Which kind of support for starting up a business would you wish for from your university/ technical college?

Type of support wanted	Quantity	Percentage
Business plan seminars	4,749	59.9%
Coaching for the starting up of an own business	4,886	61.6%
General seminars and lectures to the topic of starting up a business	4,248	53.6%
Business game - starting up a business	2,493	31.4%
Get-togethers and discussions with other young entrepreneurs (e.g. club)	2,591	32.7%
Symposia, start-up days, contact platforms	1,428	18.0%
Contact point for general questions to starting up a business	3,471	43.8%
Seed financing by the university / technical college	2,655	33.5%
Incubators (Service centre for early stage start-ups)	1,773	22.4%
No further offers	310	3.9%
Other 1:	253	3.2%
Other 2:	37	0.5%
Other 3:	14	0.%
Total	7,930	364.5%

Note: Responses to Other 1, 2 and 3 were varied. However, 62 of the 304 suggestions, about 20%, referred to some type of mentoring program.

Here we compare all those groups who had thought more than just 'Sketchily' about becoming an entrepreneur (i.e. those Concretely' thinking about it through to the Self Employed, see Table 6.1 incl. footnote). Results consistently show significant differences ($p<.05$) between all groups in total and for dyadic combinations in their requests for *'business games for starting up your own business', 'start-up days, symposia, contact platforms', 'contact points for general questions',* and *'incubators'.* The fewest significant differences (albeit still at the 10% level) occur between those thinking 'Rather concretely' and 'Bound and Determined'.

Table 10.1. Support Sought by Commitment to Entrepreneurship

Commitment to Entrepreneurship**	Support for Start Ups as Sought by different Groups in %			
N= 1906	Business games	Symposia	Contact Points	Incubators
Rather Concretely	38	19	45	25
Bound & Determined	40	18	43	25
Already Started	32	19	40	28
Self-Employed	23	29	58	38

** *This scale here is formed by replicating the categories in Table 6.1 but dropping category 4 (thought about it but turned away from it) and category 8 (yes, I was self-employed but turned away from it)*

Results in Table 10.1 give an interesting insight as to what the differing groups at different stages of getting their start-up to succeed appear to require. Obviously, concrete advice at 'Contact Points' is a highly sought after option by all groups and particularly by the Self-Employed.

The next most sought after option is 'Business Games'. These allow students to execute decisions in a simulated environment and are frequently used in industry training (but also at Business Schools, e.g. Otago University, Department of Marketing). Next up are 'Incubators' which are particularly highly sought after by the already self-employed. The least favoured by most groups, yet significantly more often chosen by the Self-Employed are 'Symposia'. Initiatives by Chambers of Commerce and other institutions (e.g. the Westpack bank's mentoring scheme) are certainly in high demand. The results highlight that there is need for more, and for more differentiated assistance that universities can help develop and offer.

It is interesting to note that the Self-Employed favour this latter resource (symposia). It parallels but is distinctly different from the high result in the 'Contact Point' column and indicates a strong desire not only for personal exchange but also for exposure to current and new practices in entrepreneurship.

The need for personal coaching is further highlighted by an analysis of the 'other category' (see footnote in Table 10) in which 20% out of the 304 suggestions indicated a preference for *mentoring systems* at universities.

4. PERSONALITY TRAITS AND OTHER CHARACTERISTICS

The survey also asked students to tell us what they think of themselves and what they believe others think of them regarding their personality, ability to lead, delegate and communicate. The following tables distinguish first those with differing aspirations in employment ('other' vs. 'self-employed', compare Table 7). Subsequently, we compare groups according to their levels of commitment to becoming entrepreneurs (E-Commitment, see Table 6.1).

The personality dimensions used in this survey are based on an application of the Big Five (se e.g. John and Srivastava, 1999) using 25 items falling into 5 personality dimensions. These are called, Extroversion, Conscientiousness, Emotional Stability, Culture, and Compatibility.

Extroversion is indicated by such items as to how sociable, talkative and open students consider themselves. *Conscientiousness* is measured by questions relating to how thorough, exact, and tidy they feel they are. *Emotional Stability* relates to robustness, self-satisfaction and confidence, while *Culture* relates to how, for example, creative, artistic and imaginative students think they are. Lastly, *Compatibility* asks for levels of how good-natured, peaceful or unselfish students are.

4.1. PERSONALITY CHARACTERISTICS BY LEVELS OF COMMITMENT TO ENTREPRENEURSHIP

Table 11 shows the relative strength in the five character dimensions. Apart from the second dimension, Conscientiousness, in which there were no significant differences between the E-Commitment groups, all others were highly significant.

Table 11. Relative Personality Differences between Levels of Commitment to become an Entrepreneur

Commitment to Entrepreneurship**	Personality Dimensions				
N= 7374	Extroversion*	Conscientious (not sig. diff.)	Emotional Stability*	Culture*	Compatibility*
Never thought it	Lo	Lo	Lo	Lo	Hi
Thought Sketchily	Lo	Med	Med	Lo-med	Hi
Rather Concretely	Med	Med	Med	Lo-med	Lo-med
Bound & Determined	Hi	Med	Hi	Med-hi	Lo-med
Already Started	Hi	Med	Hi	Hi	Lo
Self-Employed	Lo	Hi	Med	Hi	Lo-med

* *sig. p< .000; Monte Carlo sig. < .002*

** *This scale here is formed by replicating the categories in Table 6.1 but dropping category 4 (thought about it but turned away from it) and category 8 (yes, I was self-employed but turned away from it)*

The findings show that entrepreneurs see themselves as not very compatible with others, i.e. not very patient, more selfish, and more as having a fighting spirit. It is also notable that those who are "Bound & Determined" to become entrepreneurs and those who "Already Started to Realise their Business Plans" tend to be more extroverted, and also emotionally less sensitive and less vulnerable. All in all, these budding entrepreneurs appear as more aggressive than all others even more than those who are self-employed already. This finding is in line with other studies which show that students with business aspirations are often less ethically minded than those whose jobs and positions they aspire to out in the industry.

4.2 PERSONALITY CHARACTERISTICS ACCORDING TO TYPE OF EMPLOYMENT SOUGHT

When comparing students on their own perceived personality characteristics according to where they see themselves employed 5 years after leaving university, the following picture emerges (see Table 12). Public Servant and University careers are sought by those who, on one hand, see themselves as more introverted and emotionally more vulnerable. On the other, they describe themselves as more compatible with others in terms of a more compromising, harmonious nature.

Those seeking employee status in small or large firms (the 'Other Employed') describe themselves as similarly individualistic and low on *Compatibility* as do the Self-Employed. While the Other-Employed 5 years after leaving university see themselves as emotionally more stable and less vulnerable than the Public Servant/Uni Researcher, they see themselves as significantly less extroverted than the Self-Employed.

There is only one substantial difference in results when comparing the 'Employment Sought' groups (see Table 7) in their first 5 years after leaving university with employment aspirations sought *after* 5 years from leaving. This difference occurs on the dimension of Conscientiousness (indicating diligence, attention to detail, tidiness etc.).

Those aspiring Public Service/ University careers differ significantly in their self perception on the dimension of *Conscientiousness* from the two other groups. However, this difference disappears when students are asked where they see themselves after 5 years of leaving university. It indicates that there occurs a regrouping of students in employment status that evens out any differences as to *Conscientiousness.* In other words, two reasons can be summarised for the trend indicated in Table 7. Many students see a) 'other-employment' first before becoming self-employed, and b) because they seek to become more conscientious and diligent at what they are doing for their business.

These findings therefore suggest opportunities for shortening the time period for entrepreneurs to get to market. Structuring learning processes and mixing theoretical instructions with targeted internships may well offer a) increased success of entrepreneurs and b), even greater numbers of students actually turning entrepreneur.

Table 12. Personality Characteristics According to Type of Employment Sought

Employment Sought after 5 Years from leaving University	Relative Personality Characteristics				
	Extroversion	Conscientiousness	Emotional Stability	Culture	Compatibility
Other Employed	Med	Ns*	High	Low	Low
Public Servant/ Uni Researcher	Low	Ns*	Low	High	High
Self Employed	High	Ns*	High	High	Low

** Significant differences do occur between the Public Servant/ Uni Researcher and the other groups, however, in the first 5 years after leaving*

Furthermore, and as a consequence of these results for universities and their course delivery, there appears to be support for more emphasis on formal aspects of work habits from entrepreneurial students themselves. In other words, hands-on experience and care in the planning, execution and evaluation stages of routines are implied to be highly desirable skills.

Likewise, the consistent indication of low *Compatibility* amongst entrepreneurial spirits calls for extended experiences of teamwork skills as important corollaries of leadership skills.

It is interesting to note that the Other Employed group consistently scores lowest on *Compatibility,* whether within the first five years after leaving or afterwards by which time many see themselves as moving into the Self-Employed group. To the extent that certain personality characteristics make a student more likely to become entrepreneur, there is a need for research that establishes what type of motivations need to be stimulated and advice given to turn more Other-Employed into ones interested in self-employment. Further and more detailed analysis of the different categories amongst the Other Employed (4 groups, see Table 7) may shed more light on this but will not be pursued further here.

5. ENTREPRENEURSHIP AND BUSINESS SKILLS

Testing for business skills, 15 items asked for students' perceptions of their ability to communicate, coordinate tasks, negotiate, sell, etc. Altogether 9 of these items fell into 3 different dimensions (Principal Component analysis, explaining 71% of the variance; Cronbach alpha .82). All items were introduced by the phrase, "Colleagues say that I am ..." and were followed by a 6-point scale anchored 1= very bad to 6= very well.

The first factor, **Communicate** involves such skills as the *Ability to Present* and *Communicate;* **Functional Skills** involves *Numerical* and *Technical Skills,* while **Delegation Skills** cover items such as *Delegation* and *Cooperation Skills.*

Table 13.1. E-Commitment by Business Skill Dimensions

Commitment to Entrepreneurship	Business Skill Factors		
N= 7932	Communicate	Functional	Delegation
Never thought it	Lo	Lo	Lo
Thought Sketchily	Lo	Lo	Med
Rather Concretely	Med	Med	Med
Bound & Determined	Med	Med	Med
Already Started	Hi	Med	Med
Self-Employed	Hi	Hi	Hi

Table 13.2. E-Commitment by Individual Business Skill Items

Commitment to Entrepreneurship	Business Skill Items*					
N= 7932	Coordinate Tasks	Develop Alternative Plans	Motivate & Inspire People	Negotiate	Sell	Organise and Plan
Never thought it	Lo	Lo	Lo	Lo	Lo	Lo
Thought Sketchily	Lo	Lo-med	Lo-med	Lo-med	Med	Lo
Rather Concretely	Med	Med	Med	Med	Med	Lo-med
Bound & Determd	Med	Med-hi	Med-hi	Med-hi	Hi	Med-hi
Already Started	Med	Hi	Hi	Med-hi	Hi	Med-hi
Self-Employed	hi	Med-hi	Med-hi	hi	Hi	Hi

**all items are significantly different between the groups ($p < 0.5$)*

Both Tables 13.1 and 13.2 inform us on students' business skills as they believe others would see them. Table 13.1 uses dimensions as these are a little more transparent while Table 13.2 uses the remaining 6 items not subsumed under any of the above dimensions. Students regard these skill-items as separate and distinct fields of application.

The results are uni-directional and clear: the more students are down the track of actually thinking about their own business, even if they are still planning, or have actually started to put plans into motion, the more do they feel in possession of the necessary business skills. The question for this scale was projective beginning with "Colleagues say I can ...(e.g. negotiate)". While this brings an extra element of self-critical evaluation as opposed to wishful thinking on the part of the student into the answers, it must be added that the (self) confidence levels of students are rather high. When analysing the distributions of the answers to each point of the scale (see Table 13.3) it shows that often more than 60% believe that they can fulfil any of those tasks at least "rather well".

Table 13.3. Self Evaluation of Students' Personal (Business) Skills

Colleagues say that I can...		Very bad	Pretty bad	Rather bad	Rather well	Pretty well	Very well	Total
1) communicate	Quantity	10	55	316	1,788	3,860	1,941	7,970
	Percent	0.1%	0.7%	4.0%	22.4%	48.4%	24.4%	100%
2) present	Quantity	23	104	615	2,377	3,459	1,392	7,970
	Percent	0.3%	1.3%	7.7%	29.8%	43.4%	17.5%	100%
3) represent my opinion	Quantity	6	73	464	2,235	3,553	1,639	7,970
	Percent	0.1%	0.9%	5.8%	28.0%	44.6%	20.6%	100%
4) coordinate tasks	Quantity	7	70	402	2,065	3,753	1,673	7,970
	Percent	0.1%	0.9%	5.0%	25.9%	47.1%	21.0%	100%
5) develop alternative plans/scenarios	Quantity	3	63	514	2,582	3,518	1,290	7,970
	Percent	0.0%	0.8%	6.4%	32.4%	44.1%	16.2%	100%
6) motivate / inspire people for tasks	Quantity	26	149	851	2,713	3,037	1,194	7,970
	Percent	0.3%	1.9%	10.7%	34.0%	38.1%	15.0%	100%
7) hand tasks over to 3rd person / third party	Quantity	55	258	1,271	2,856	2,657	873	7,970
	Percent	0.7%	3.2%	15.9%	35.8%	33.3%	11.0%	100%
8) co-operate with different kinds of people	Quantity	18	60	294	1,618	3,420	2,560	7,970
	Percent	0.2%	0.8%	3.7%	20.3%	42.9%	32.1%	100%
9) negotiate	Quantity	30	121	832	2,460	3,287	1,240	7,970
	Percent	0.4%	1.5%	10.4%	30.9%	41.2%	15.6%	100%
10) sell	Quantity	164	418	1,520	2,679	2,223	9,66	7,970
	Percent	2.1%	5.2%	19.1%	33.6%	27.9%	12.1%	100%
11) organise and plan	Quantity	22	110	528	1,918	3,275	2,117	7,970
	Percent	0.3%	1.4%	6.6%	24.1%	41.1%	26.6%	100%
12) handle numbers	Quantity	87	251	747	1,797	2,779	2,309	7,970
	Percent	1.1%	3.1%	9.4%	22.5%	34.9%	29.0%	100%
13) handle technical devices (e.g. computers)	Quantity	50	141	557	1,926	2,955	2,341	7,970
	Percent	0.6%	1.8%	7.0%	24.2%	37.1%	29.4%	100%
14) my literacy	Quantity	15	41	231	1,127	2,729	3,827	7,970
	Percent	0.2%	0.5%	2.9%	14.1%	34.2%	48.0%	100%
15) interact with people	Quantity	11	51	273	1,408	3,567	2,660	7,970
	Percent	0.1%	0.6%	3.4%	17.7%	44.8%	33.4%	100%

Those students who are right on the threshold of 'having started to realise their business plan' but are not actually trading yet appear particularly confident whereas, in contrast, the self-employed show a somewhat more self-critical perspective. When judging their abilities to Motivate and Inspire people for tasks (see Table 13.2), or develop realistic alternatives in the face of difficulties or adversity, the self-employed seem to bring a sense of sober realism into the results that there is a difference between thinking about an issue as opposed to actually executing decisions in the field.

It is important to discuss for the delivery of entrepreneurial classes and events whether students with entrepreneurial inclinations need to be alerted to the potential of hybris and encouraged to continuously refine their skills for their own good.

6. THE VALUES STUDENTS STRIVE FOR IN THEIR WORKING LIVES

A scale of 18 items measured what goals and values students associate with their working lives. These ranged from general issues such as 'freedom', independence', or to 'create something', to more mundane or specific goals such as 'job-security', 'easy tasks' or to 'enhance the detail of existing solutions'.

Half of these 18 items converged into 3 factors (Principal Component analysis, explaining 60% of the variance; Cronbach alpha = .66). The first dimension, Creativity, has students seek *Challenges, Opportunities and Outlets for Creativity.* The second dimensions encompasses ideas concerning Work Conditions, including *Job Stability, Regulated Hours and Easy Tasks.* The final dimension Freedom, encompasses *Freedom & Sufficient Leisure Time.*

Table 14. E-Commitment by Business skill Factors

Commitment to Entrepreneurship	Business Skill Factors		
N= 7932	Creativity	Work Conditions	Freedom & Leisure
Never thought it	Lo	Hi	Not significantly different between the groups
Thought Sketchily	Lo-med	Med-lo	
Rather Concretely	Med	Med-hi	
Bound & Determined	Med-hi	Med	
Already Started	Hi	Lo-med	
Self-Employed	Med-hi	Lo	

The results clearly show that entrepreneurs see themselves as more creative than others and do not shy away from hard work the more they are committed to the idea. It fits into the picture of the energetic, outgoing and creative character of entrepreneurs. Table 14 also shows up the self-image of those who 'Already Started to Realise' their business and the Self-Employed. The latter appear more realistic as to their capabilities in terms of creativity and less picky when it comes to hard work.

7. THE OTAGO SAMPLE

At the time of printing, and in order to ascertain that the sample is representative, the actual numbers of students studying in their subjects at Canterbury University could not be established. However, we have the data available for Otago.

The categorisation into subject areas had to follow the lead from the European universities. These are not quite compatible with those used in New Zealand. However, great care has been taken to ascertain an approximation that would permit a comparison of the sample to the population.

Table 15. In which field of study are you majoring / pursuing your PhD at Otago University?

	Frequency	Percent of Otago Sample	% of Otago University Population In this Subject Area
Economics	267		
Business administration	519		
Business information systems	182	Sum=21.6%	21.6%
Law	354	8.2	6.7%
Mathematical Sciences (mathematics, information systems, astronomy)	233	5.4	3.5%
Natural Sciences (chemistry, biology, geology, geography)	583	13.6	12.6%
Medical Sciences and Pharmaceutics	980	22.8	26.7%
Civil Engineering, Architecture	33	.8	.1%
Mechanical and Electrical Engineering	12	.3	.3%
Agricultural and Forestry Science	4	.1	.02%
Theology	21	.5	1.2%
Philology and Literary Studies	95	2.2	4%
Science of History and Cultural Studies	163	3.8	3.4%
Social Sciences (psychology; sociology and similar subject	670	15.6	15.9%
Sports/ Physical Education	178	4.1	4.1%
Military Sciences	1	.0	
Total	4295	100.0	100

Table 15 shows that the sample covers the population sufficiently to make general statements at the faculty or subject level. This is important for estimations as to how many potential entrepreneurs there are in faculties and subject areas across the university (see Table 16)[3].

3 *While there are a few numbers that appear to under-represent the actual student count (see Table 15), in the case of Medical Sciences and Pharmaceutics it can be easily explained. The Otago student software simply cannot exclude its Canterbury and Wellington Campuses so that they appear in the overall Population but have, in fact, not been included in the survey.*

7.1 ENTREPRENEURIAL STUDENTS AT OTAGO UNIVERSITY

Table 16 shows the number and percentages of students and how committed they are to entrepreneurship according to the subjects they study. Of those committed to becoming an entrepreneur, the numbers fluctuate between a high of 36% in Business Information Systems and 19.6% in Sports / Physical Education. It may be added, that Engineering is not Otago's specialty but rather that of Canterbury, hence the low numbers of students.

Of those who have already started to trade or just about to (see the Started column), between 6 and 8% can be found in the commerce subjects and amongst philologists we can find even 10% of entrepreneurs. The general conclusion from this table is therefore that a) there are substantial numbers of potential entrepreneurs across campus and b) that only some 22% of all students actually take business subjects although far more may be in need of these in order to help them realise their intentions and give their success a solid grounding.

All data can be analysed further, for example, by ethnic origin or students' particular needs according to the subject area they study.

As could be ascertained, 15,452 students were contacted in April 2006 (Semester I) and reminded again in May to participate. However, only those enrolled in the second semester were included in the mail-out. In the end, the population for Semester II at Otago campus was around 18,000 while the total number were 20, 817. Some double counting puts further pressure on the exactness of the count of students because of double degrees. Nonetheless, the sampling appears sufficiently robust so that the results are much better than just 'ball-park figures'.

Table 16. Levels of Commitment to Entrepreneurship by Subject Areas at University of Otago

Major Subject / PhD Area		Level of Commitment to Entrepreneurship			
		Not Really	Committed	Started	Total
Economics	Count % within Major/ Ph.D.?	164 64.6%	71 28.0%	19 7.5%	254 100.0%
Business Administration	Count % within Major/ Ph.D.?	286 60.3%	159 33.5%	29 6.1%	474 100.0%
Business Information Systems	Count % within Major/ Ph.D.?	95 56.2%	61 36.1%	13 7.7%	169 100.0%
Law	Count % within Major/ Ph.D.?	245 74.0%	68 20.5%	18 5.4%	331 100.0%
Mathematical Sciences	Count % within Major/ Ph.D.?	146 67.9%	57 26.5%	12 5.6%	215 100.0%
Natural Sciences	Count % within Major/ Ph.D.?	437 79.3%	96 17.4%	18 3.3%	551 100.0%
Medical Sciences and Pharmaceutics	Count % within Major/ Ph.D.?	684 74.5%	205 22.3%	29 3.2%	918 100.0%
Civil Engineering, Architecture	Count % within Major/ Ph.D.?	23 71.9%	6 18.8%	3 9.4%	32 100.0%
Mechanical and Electrical Engineering	Count % within Major/ Ph.D.?	6 50.0%	4 33.3%	2 16.7%	12 100.0%
Agricultural and Forestry Science	Count % within Major/ Ph.D.?	3 100.0%	0 .0%	0 .0%	3 100.0%
Theology	Count % within Major/ Ph.D.?	9 60.0%	5 33.3%	1 6.7%	15 100.0%
Philology and Literary Studies	Count % within Major/ Ph.D.?	63 70.8%	17 19.1%	9 10.1%	89 100.0%
Science of History and Cultural Studies	Count % within Major/ Ph.D.?	97 64.2%	43 28.5%	11 7.3%	151 100.0%
Social Sciences	Count % within Major/ Ph.D.?	479 76.0%	118 18.7%	33 5.2%	630 100.0%
Sports	Count % within Major/ Ph.D.?	130 77.4%	33 19.6%	5 3.0%	168 100.0%
Military Sciences	Count % within Major/ Ph.D.?	0 .0%	0 .0%	1 100.0%	1 100.0%
Total Count % within Major/ PhD?		2867	943	203	4013
		71.4%	23.5%	5.1%	100.0%

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