What are the Influencers of Graduate Satisfaction and Labour Market Outcomes of Ontario College Graduates?

An Analysis of Ontario's College Graduate Satisfaction Survey

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Table of Contents

List of Figures

List of Tables

Executive Summary

Ontario's 24 publically funded colleges have been conducting annual surveys on college graduates since the 1970s and have been a part of the provincially mandated Key Performance Indicator (KPI) Initiative since 1998. The survey is administered to graduates six months after graduation through telephone surveys by an external service provider. The survey was introduced to give the province and public an idea of how the college sector is performing overall, and to inform future students on career choices. The results have primarily been used to gauge the performance of colleges on three of the five KPIs: graduate satisfaction, employment rate, and employer satisfaction, each of which are tied to a modest amount of performance funding and are made public. Additionally, annual salary and employment rate by program are made public by the Ontario government and colleges in order to provide labour market information to potential students. Many colleges also use the results for internal program reviews and institutional planning. However, an in depth analysis of what influences the key graduate outcomes of income, employment, and graduate satisfaction has not been done on a system-wide level. Therefore, the objective of the current study was to determine whether factors such as size of institution, region, program mix, demographics of graduates, employment, or continued education impact graduate satisfaction. Moreover, for graduates in the labour force, factors which impact earnings and employment were also analyzed.

In this paper, the following research questions were posed, using the graduate survey data files from 2001-02 to 2006-07.

- Does age, gender, field of study, credential type, or institutional size independently influence satisfaction, earnings, or employment rate?
- What role do activities subsequent to graduation such as labour market experiences or further education play in graduate satisfaction?
- Does satisfaction with various aspects of educational quality, such as quality of instruction or course content contribute to graduate satisfaction or earnings? Does satisfaction with the development of specific skills impact overall graduate satisfaction or earnings?

From 2002 to 2007, graduates' satisfaction increased from 79.7% to 82.5%. The employment rate also increased during these years, with an average 90% of college graduates in the labour market finding jobs within six months after graduation. The salary of the employed graduates also rose over these years, with average wage around 15 dollars per hour. The results in this study demonstrate the importance of field of

study, credential type, attaining work related to field of study, and the graduates' satisfaction with various other aspects of their college program to graduate outcomes.

For all graduates, there was no significant difference in satisfaction between regions. Health graduates and one-year certificate holders were the most satisfied among all fields of study and all credentials, respectively. Graduates working at related jobs were the most satisfied, followed by those studying and not working. Graduates working at unrelated jobs were the least satisfied. However, those factors can explain only around 10% of the variance in graduate satisfaction.

The models for employed graduates are much stronger when the additional questions asked specifically of the employed graduates were included. As expected, those who earn more are more satisfied. Those in a job related to their field of study earn more and are more satisfied as well. Graduates in a job that requires more education earn more, but are not necessarily significantly more satisfied. Those working at a job that requires a university degree were paid the highest, but they were not more satisfied than others. Unexpectedly, graduates working full-time were paid a lower hourly salary than those working part-time, but they were not less satisfied. In addition to labour market outcomes, employed graduates' satisfaction with the specifics of their programs such as course content; whether courses were up-to-date; quality of instruction; whether equipment was up-to-date; preparation for the job market and skills developed in co-op, clinical, field placement experience, and career placement services had a significantly positive effect on graduates' overall satisfaction. However, only satisfaction with preparation for the job market had a consistently positive effect on graduates' salary. Additionally, employed graduates' satisfaction with skills related to specific job preparation and critical thinking had a positive influence on their overall satisfaction.

For those in the labour market, it was more difficult for older or male graduates to find a job than younger or female graduates. However, their salaries were higher when they found a job. Health graduates were the most likely to find a job and were the highest paid among all fields of study. Engineering graduates' employment situation was not consistently better than graduates of business, but their salaries were significantly higher. Hospitality graduates were more likely to find a job than business graduates, but earned significantly lower. Among all college credentials, certificate holders were the least likely to find a job, and also earned the least. Interestingly, they were not significantly less satisfied than other credential-holders.

The major policy question here is whether a college can do anything to alter graduate satisfaction or employment rate. In other words, is graduate satisfaction or employment rate useful as a KPI? The

current study was limited in determining influencers of employment rate, due to the limited information in the survey on graduates not working. Therefore, the question on whether a college can its influence employment rate cannot be answered here. However, the analysis does demonstrate that type of credential and the field of study does impact employment rate controlling for available variables. Although for performance funding purposes, the Ministry of Training, Colleges and Universities does factor in regional employment rates, it does not take into consideration credential mix and field of study mix of the institution, both of which contribute significantly to the employment rate.

The results show, as would be expected, that employed graduates' overall satisfaction is influenced strongly by the quality of the job the graduate has obtained (i.e. higher salary, job related to program, job requires PSE). However, it is also independently influenced by graduate satisfaction with various aspects of educational quality, such as quality of instruction, course content and whether or not the graduate considered the skills gained in college to be "helpful" in obtaining a job. Additionally, graduates who were more satisfied with skills and abilities specific to their job, such as job-related knowledge and skills were also more satisfied overall. Therefore, an institution can improve its graduate satisfaction either by improving teaching and learning quality and students' skill development and/or by helping its graduates to obtain high quality jobs. In terms of job quality, although local labour market conditions may be out of an institution's control, colleges may be able to improve by continuing to align with local labour markets, and by providing students and graduates with job searching strategies and career counseling. Furthermore, for the employed graduates, field of study, region or credential did not significantly impact overall satisfaction when job quality and educational quality are controlled for. Therefore, overall graduate satisfaction could be a fairly reasonable proxy for the overall educational quality of a college, demonstrating its usefulness as a KPI. However, an institution should strive for improvement of the indicator, particularly within programs, rather than using it as a comparison tool with other colleges.

Introduction

In 1998-99, the Ministry of Training, Colleges and Universities (MTCU) and the Colleges of Applied Arts and Technology (CAATs) defined five Key Performance Indicators (KPIs) "to measure, in a consistent manner across the college system, college performance against ministry stated goals and objectives" (MTCU, 2009:1). The five KPIs include: graduate satisfaction, employer satisfaction, employment rate, student satisfaction, and graduation rate. However, Ontario's 24 publically funded CAATs have been conducting an annual survey of college graduates since as far back as the 1970s, and until 1998-99 were administered by the colleges themselves. As part of the KPI initiative, the graduate survey expanded and a neutral third party began conducting the survey. The current graduate survey, mandated and funded by Ontario's Ministry of Training, Colleges and Universities (MTCU), is administered to graduates approximately six months after graduation through telephone surveys conducted by an external service provider with a target to contact a minimum of 72 per cent of the graduates on a college wide basis. Also, the graduate, if willing, provides the contact information of their employer for a follow-up survey. The colleges provide the service provider, in addition to contact information, graduate characteristics such as age, gender, and program of study.

On a system wide level, the results have primarily been used to gauge the performance of colleges on three of the five KPIs: graduate satisfaction, employment rate, and employer satisfaction, each of which are tied to a modest amount of performance funding and are made public. Additionally, annual salary and employment rate by program are made public by the Ontario government and colleges in order to provide labour market information to potential students. Many colleges also use the results for internal program reviews and institutional planning. However, an in depth analysis of what influences the key graduate outcomes of income, employment, and graduate satisfaction has not been done on a system-wide level. Therefore, the objective of the current study was to determine whether factors such as size of institution, region, program mix, demographics of graduates, employment, or continued education impact graduate satisfaction. Additionally, for graduates in the labour force, factors which impact earnings and employment were also analyzed.

In this paper, the following research questions were posed, using the graduate survey data files from 2001-02 to 2006-07.

- Does age, gender, field of study or credential type, institutional size independently influence satisfaction, earnings, or employment rate?

- What role do activities subsequent to graduation such as labour market experiences or further education play in graduate satisfaction?
- Does satisfaction with various aspects of educational quality, such as quality of instruction or course content contribute to graduate satisfaction or earnings? Does satisfaction with the development of specific skills impact overall graduate satisfaction or earnings?

The major policy question is whether a college can alter its graduate satisfaction or employment rate. Are these measures useful as KPIs? The wording of the question used to determine graduate satisfaction, "How would you rate your satisfaction with the usefulness of your college education in achieving your goals after graduation?", has occasionally been questioned, since goals after graduation may vary depending on the individual, and may not relate to educational quality. Likewise a college's employment rate could be impacted by its program mix and the age and gender of its graduates, and the local economy.

Data Source

As an agency of the government of Ontario, the Higher Education Quality Council of Ontario (HEQCO) was provided access to the anonymized raw data files of the Graduate Satisfaction Survey for the years 2001-02 to 2006-07, resulting in over 250,000 individual graduate observations. The key outcome variable, graduate satisfaction, is defined as the graduates' "satisfaction with the usefulness of their college education in achieving their goals after graduation" (Q34). This question also serves as a KPI. Maximum likelihood logistic regressions were performed for the per cent satisfied (satisfied and very satisfied) and the employment rate. Log linear regressions were performed for the hourly salary. Hourly salary was used so that those working full- and part-time could be included in the regression model. Analysis was performed on the following three groups:

1. ***All survey respondents***. Graduate characteristics, college size, college location by provincial region, credential type, current status of graduates (e.g., working in a related field, studying, etc), and field of study served as independent variables, with graduate satisfaction as the dependent variable (Figure 1).
2. ***Graduates in Labour force.*** For graduates who were considered to be in the labour force (not attending school full-time, and working or looking for work) the factors mentioned above for all respondents were independent variables, with employment (full- or part-time) serving as the dependent variable (Figure2).
3. ***Employed Graduates.*** For graduates who were currently working, in addition to the factors mentioned above for all respondents, independent variables included: education required for job,

importance of and satisfaction with skills required for job, satisfaction with various aspects of their program at college, earnings, and whether they were working full-or part-time. The dependent (outcome) variables included graduate earnings as well as graduate satisfaction for goal achievement (Figure 3).

Figure 1. Influencers of graduate satisfaction: All graduate survey respondents

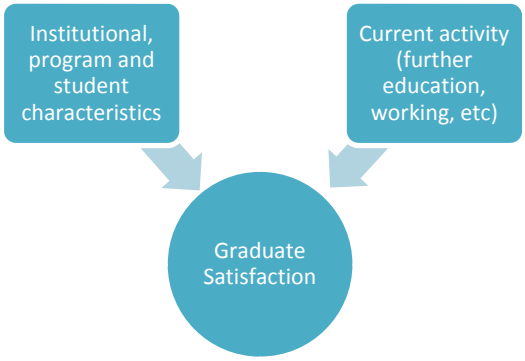


Figure 2. Influencers of employment rate: Graduate survey respondents in the labour force

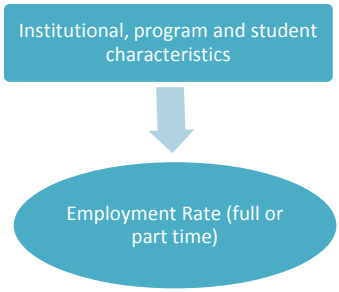


Figure 3. Influencers of graduate satisfaction and hourly salary: Employed graduate survey respondents

Those surveyed included all CAAT graduates from postsecondary programs of instruction approved for funding. The requirements for the administration and the publication of KPI data are described in the Ministry of Training Colleges and Universities' Graduate and Employer KPI Survey Operating Guide. The survey population is drawn from the administration records of each college. Each CAAT provides the names and contact information for all of its graduates and the service provider conducts a telephone survey with a target to contact a minimum of 72 per cent of the graduates on a college-wide basis. Additionally, the graduate record file of each college is examined by college auditors and reported to MTCU. In the years studied, the average response rate was 74 per cent, resulting in almost 250,000 valid responses from 2002 to 2007 (Table 1).

Table 1. Total number of graduates and survey response rate, 2002-2007

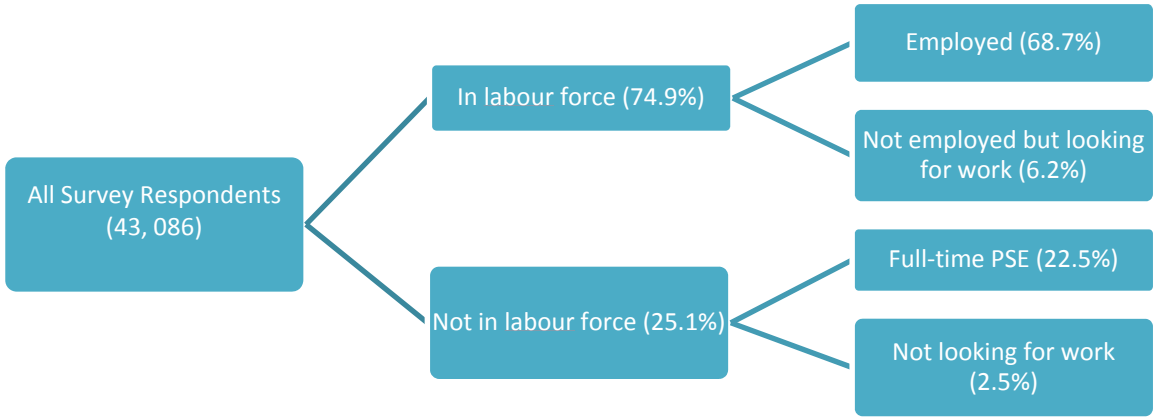
Year	Total Graduates [1]	Total Graduates in Survey[2]	Response Rate[3]
2002[4]	49,706	36,923	74.28%
2003	52,261	38,738	74.12%
2004	56,761	42,332	74.58%
2005	59,414	44,306	74.57%
2006	59,007	44,602	75.59%
2007	60,406	43,086	71.33%
2002-2007	337,555	249,987	74.06%

According to the survey structure,[5] the analysis was performed on three groups: all survey respondents; the subset of graduates in the labour force and employed graduates.

Figure 4 shows the pathways taken by the graduates in 2006-07, three-quarters of whom entered the labour market (92% were working). Of those not in the labour market, the vast majority continued on with further full time studies (90%).

[1] Total Graduates exclude 428 graduates from the Collaborative Nursing Program, 11 graduates from the Collège des Grands-Lacs and 27 graduates from a 4-year Degree Program that is not the Collaborative Nursing Program, previous to 2007.
[2] Total Graduates in Survey are graduates who answered question 1 (whether currently attending an educational institution).
[3] Response rate= Total Graduates in Survey/ Total Graduates
[4] The graduates in Year 2002 survey include summer 2001 graduates (May-Aug.), fall 2001 graduates (Sep-Dec) and winter 2002 graduates (Jan-Apr). Surveys of other years have the same respective definition.
[5] In the survey, all graduates were asked a few common questions such as: whether they were attending an educational institution (question 1), satisfaction with preparation for achieving goals (question 34), whether they would recommend the program and why (question 35, 36), and whether they recommend the college and why (question 37, 38). Graduates currently studying were asked questions on further education (question 2 to 5), while graduates currently not studying full-time were asked employment related questions (question 6 to 33).

Figure 4. Pathways of Ontario college graduates six months after graduation, 2006-2007[6]



Descriptive Profile of Graduates

For this analysis, the graduates were categorized according to gender, age, field of study, credential type, funding type, and size of their institution of graduation. This information, with the exception of institutional size, was obtained or derived from the graduate data record supplied by the college. Appendix 1 contains the groupings of the colleges by region and size. The occupation cluster grouping by field of study can be found in Appendix 2. The description of these graduates and the respondents to the survey is shown in Table 2. Due to the high response rates, the survey respondents are quite representative of the graduate population. However, younger graduates and those with one year certificates are somewhat more likely to respond, and international graduates were less likely to respond. On average, for the years analyzed, college graduates are more likely to be female (58% female), with 26% of graduates under 22 years of age and 32% over 25 years of age. Four percent of graduates are international students. The majority of graduates come from large colleges (59%), 11% graduate from small colleges, and 31% from medium-sized colleges. Three quarters of students graduate with a 2- or 3-year diploma; 18% with a 1-year college certificate; and 8% with a graduate certificate. The first cohort of 4-year degree graduates completed their studies in 2006-07, comprising almost 1% of the graduates in that year.

[6] Those attending further education part-time may have been in either group. If they were currently working or looking for work they were placed in the labour force. Those who indicated that they were working full-time were not asked about employment.

Table 2. Descriptive profile of graduates and survey respondents, %, 2002-2007[7]

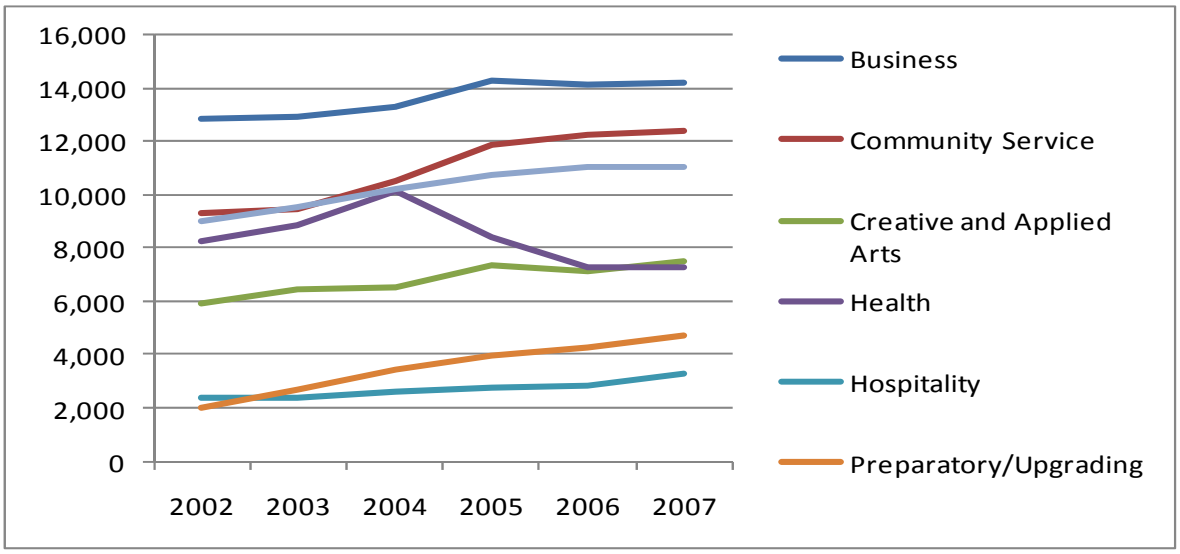
	2002		2003		2004		2005		2006		2007		Average 2002-2007	
	Grad.	Resp.	Grad.	Resp.	Grad.	Resp.	Grad.	Resp.	Grad.	Resp.	Grad.	Resp.	Grad.	Resp.
Age														
Under 22	21.4	22.3	22.3	23.6	25.1	26.6	27.6	29.0	28.5	30.0	27.2	28.6	25.5	26.9
Between 22 and 25	42.9	42.7	42.4	41.9	40.8	40.1	41.2	40.5	41.2	40.3	40.7	39.9	41.5	40.8
Older than 25	35.1	34.5	34.9	34.2	33.8	33.1	30.9	30.2	30.1	29.5	31.1	30.8	32.5	31.9
Gender														
Female	59.2	59.0	59.7	59.8	59.8	60.0	58.2	58.2	57.0	56.9	56.7	56.1	58.4	58.3
Male	39.4	39.6	39.8	39.7	39.7	39.5	41.3	41.3	42.4	42.4	42.7	43.3	40.9	41.0
Funding														
International	2.1	1.1	2.6	1.4	3.3	1.8	4.2	2.4	4.4	2.8	4.4	3.2	3.6	2.1
Ministry	95.6	96.7	95.6	96.8	94.8	96.3	95.1	96.9	95.3	96.9	94.4	95.8	95.1	96.6
Other	2.3	2.2	1.8	1.8	1.9	1.9	0.7	0.7	0.3	0.3	1.2	1.1	1.3	1.3
College Size														
Small	11.0	11.3	10.7	11.0	11.1	11.3	10.8	11.0	10.4	10.3	10.2	10.2	10.7	10.8
Medium	30.7	30.9	31.1	31.2	30.5	30.8	31.5	32.0	30.8	30.4	29.8	29.9	30.7	30.9
Large	58.3	57.8	58.2	57.8	58.4	57.9	57.7	57.0	58.8	59.3	60.0	59.9	58.6	58.3
College Region														
Central	25.1	25.2	25.3	25.6	24.6	24.8	24.4	23.8	24.7	24.6	24.5	24.0	24.8	24.6
Eastern	19.4	19.0	18.9	18.2	18.5	18.2	19.4	19.6	19.0	18.7	18.3	18.1	18.9	18.6
Metro Toronto	30.1	29.8	29.6	29.3	30.5	29.9	30.1	29.4	30.3	30.5	31.5	31.6	30.4	30.1
Northern	10.2	10.4	10.3	10.5	10.4	10.4	10.2	10.4	9.8	9.6	9.6	9.8	10.1	10.2
Southwestern	15.2	15.7	16.0	16.5	15.9	16.7	16.0	16.8	16.2	16.6	16.1	16.7	15.9	16.5
Field of Study														
Business	25.8	25.8	24.8	24.5	23.5	23.1	24.1	23.4	23.9	23.6	23.5	23.3	24.2	23.9
Community Service	18.8	19.1	18.1	18.4	18.5	18.8	20.0	20.7	20.8	20.9	20.5	20.3	19.5	19.7
Creative and Applied Arts	11.9	11.5	12.3	12.1	11.6	11.2	12.4	12.1	12.1	12.0	12.4	12.1	12.1	11.8
Health	16.5	16.4	16.9	17.1	17.8	18.2	14.1	14.4	12.4	12.6	12.1	12.5	14.9	15.1
Hospitality	4.8	4.5	4.5	4.3	4.6	4.3	4.7	4.3	4.9	4.5	5.4	4.8	4.8	4.4
Preparatory/ Upgrading	4.0	3.9	5.1	5.2	6.0	6.1	6.6	6.7	7.2	7.3	7.8	7.8	6.2	6.2
Engineering/ Technology	18.2	18.9	18.3	18.5	18.0	18.4	18.1	18.5	18.7	19.1	18.3	19.2	18.3	18.8
Credential Type														
1-Yr. Certificate	16.8	17.0	18.5	19.1	17.6	18.1	18.1	18.6	17.5	17.8	17.7	18.2	17.7	18.1
2-Yr. Diploma	48.2	48.3	46.3	46.4	47.9	47.7	50.6	50.6	52.2	51.8	50.9	50.6	49.5	49.3
3-Yr. Advanced Diploma	26.6	26.7	27.4	27.2	26.6	26.7	23.3	23.4	22.5	22.9	22.1	22.2	24.6	24.7
1-Yr. Graduate Certificate	8.4	8.0	7.8	7.4	8.0	7.5	8.0	7.5	7.7	7.4	8.5	8.2	8.1	7.7
4-Yr. Degree	--	--	--	--	--	--	--	--	--	--	0.8	0.8	0.2	0.1

Figure 5 contains the distribution of graduates by field of study. Credentials in the business area comprise the highest proportion, with community service and preparatory/ upgrading areas experiencing

[7] Values may not add up to 100% due to missing or invalid values in the administrative file and rounding.

the most growth. The impact of the shift in registered nursing from a 3-year diploma to a collaborative college-university degree was shown in the decline after 2003-04 in health fields.

Figure 5. Ontario college graduates by area of study, 2002-2007



Additional descriptive characteristics in relation to the graduate's current activity were obtained from the survey. Overall, a quarter of graduates were studying either full-time or part-time six months after graduation (Table 3). The percentage of graduates who chose to pursue further education full-time increased from 18.4% in 2002 to 22.5% in 2007. Graduate respondents were also grouped according to "current status", a variable created for the regression models. This category includes whether a graduate has returned to study full-time, is working in a job which is related, partially related or non-related to their field of study, or if they are neither working nor studying.

Figure 4 shows that on average, half of graduates are working in a related or partially related field, more than one fifth are attending school either full-time (employment status unknown) or attending part-time and not working. The proportion studying has increased over time, whereas the proportion not attending school and not working has decreased.

Table 3. Percentage of college graduates attending further education full- or part-time

	2002	2003	2004	2005	2006	2007	2002-2007
Full-time studying	18.40	18.44	20.63	22.27	22.11	22.50	20.84
Part-time studying	4.64	4.47	4.25	4.20	4.23	4.17	4.32
Not studying	76.96	77.09	75.12	73.53	73.66	73.33	74.84
Total # respondents	36,923	38,738	42,332	44,306	44,602	43,086	249,987

Table 4. Current education and employment status of surveyed graduates, %

	2002	2003	2004	2005	2006	2007	2002-2007
Studying & not working[8]	19.21	19.17	21.40	23.02	22.84	23.25	21.59
Working in a related field	44.47	42.87	41.87	41.15	41.78	42.20	42.32
Working in a partially related field	6.51	6.72	6.33	6.74	6.47	7.24	6.67
Working in a non-related field	18.35	20.04	19.72	19.55	19.95	18.30	19.34
Not studying & not working	10.80	10.56	10.11	8.90	8.25	8.13	9.39

All Respondents

Graduate Satisfaction

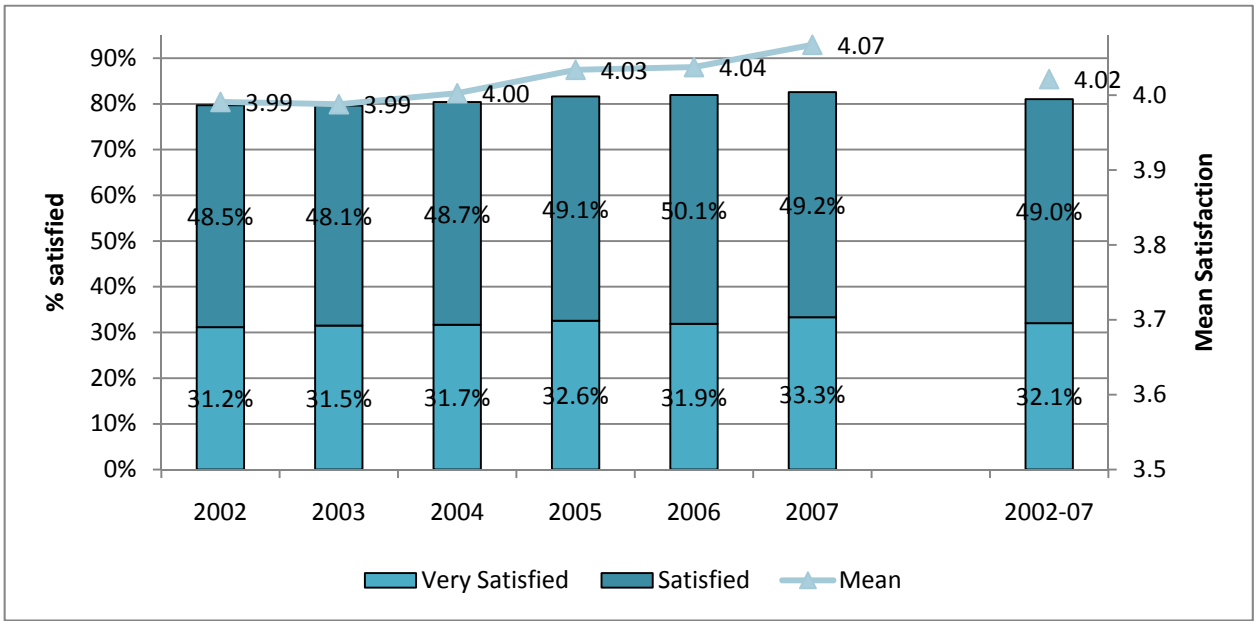
Descriptive Analysis

The graduate satisfaction outcome variable used in this analysis is the percentage of students either satisfied or very satisfied with the usefulness of their college education in achieving their goals after graduation. This question was chosen as the outcome variable for two reasons: it is the only satisfaction variable asked of all graduates and it is the variable chosen by the Government of Ontario and the colleges as a KPI.

[8] "Studying NOT Working" group includes college graduates who were attending school either full- time (employment status unknown) or attending part-time and not working six months after graduation. Full-time students were not asked about employment; those who were attending school part-time and working are captured in the working fields. Each column does not add up to 100% per cent due to missing values.

Figure 6 indicates that graduate satisfaction has been increasing slightly, with the percentage of students either satisfied or very satisfied improving from 79.7% in 2002 to 82.5% in 2007. Similarly, the mean[9] satisfaction rating has increased by 2% over the same time period.

Figure 6. Percentage and mean of graduate satisfaction

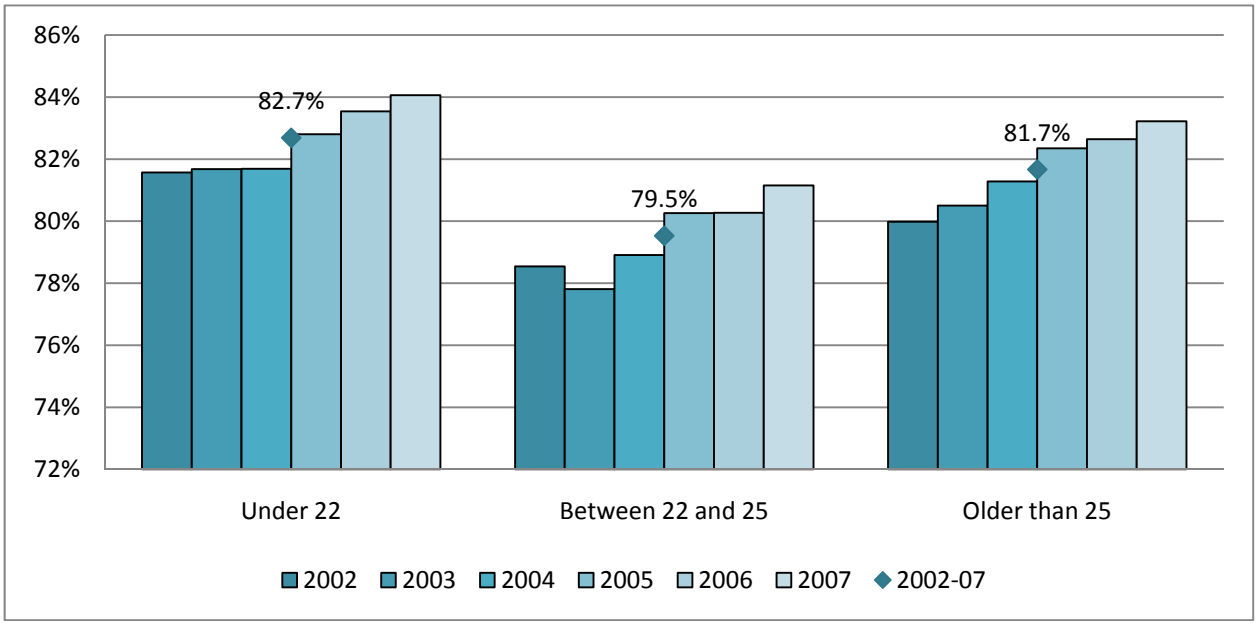


[9] According to Statistics Canada quality standards, the above estimates on means are all marginal with CV ranging from 22% to 25%.

Figures 7 to 13 illustrate trends in graduate satisfaction by various factors. The following is a brief summary of the trends across the years studied:

- ***Age*:** Satisfaction is greatest in the youngest age group (under 22 years of age) at 83%, is the lowest in the middle age range (22-25 years of age) at 80%, and moderate for older respondents at 82% (>25 years of age). Satisfaction in all age groups has been increasing since 2002.
- ***Gender:*** Males appear to be less satisfied than females overall (83% for females versus 78 % for males). However satisfaction has increased for males from 75% in 2002 to 81% in 2007, whereas it has held fairly constant for females during the same period.
- ***College Size:*** Graduates from larger institutions report lower levels of satisfaction (80%) than those from smaller ones (83%).
- ***Region:*** In a comparison by region, graduates from the metro Toronto region report lower levels of satisfaction (80%) than those outside the metro region; the northern region graduates report the highest level of satisfaction at 83%.
- ***Field of Study:*** Health graduates are the most satisfied of all the fields of study with a 91% satisfaction rate. The lowest level of satisfaction by field of study was for creative and applied arts graduates at 76%. While the fields with the most satisfied graduates such as health or community service have apparently plateaued, those in fields with lower satisfaction rates such as engineering technology and business have been increasing.
- ***Credential:*** Graduates with 1-year college certificates are the most satisfied (85%) among types of credentials, while those with graduate certificates are the least satisfied (78%). However, satisfaction of those who obtained graduate certificates has climbed from 77% in 2002 to 81% in 2007.
- ***Current Status:*** The derived category of "current status" showed the largest differences in satisfaction. This category includes whether a graduate has returned to study, is working in a related field or not, or if they are neither working nor studying six months after graduation. As would be expected, those working in jobs related to their programs are the most satisfied (92%), followed by those who have returned to study. Those working in an unrelated job were the least satisfied, at only 61%.

Figure 7. Percentage of graduates satisfied or very satisfied by age, 2002-2007[10]



[10] Age is defined as the difference between survey year and the graduate's birth year. Only graduates aged 16 to 80 were included in this chart.

Figure 8. Percentage of graduates satisfied or very satisfied by gender, 2002-2007[11]

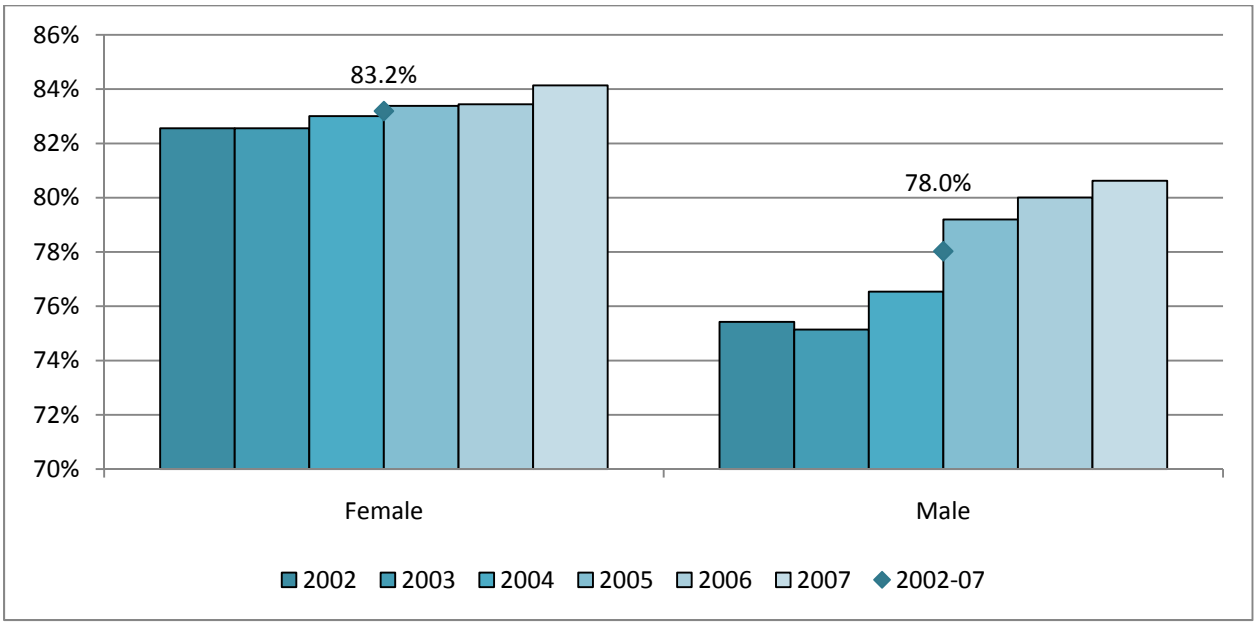


Figure 9. Percentage of graduates satisfied or very satisfied by size of institution, 2002-2007

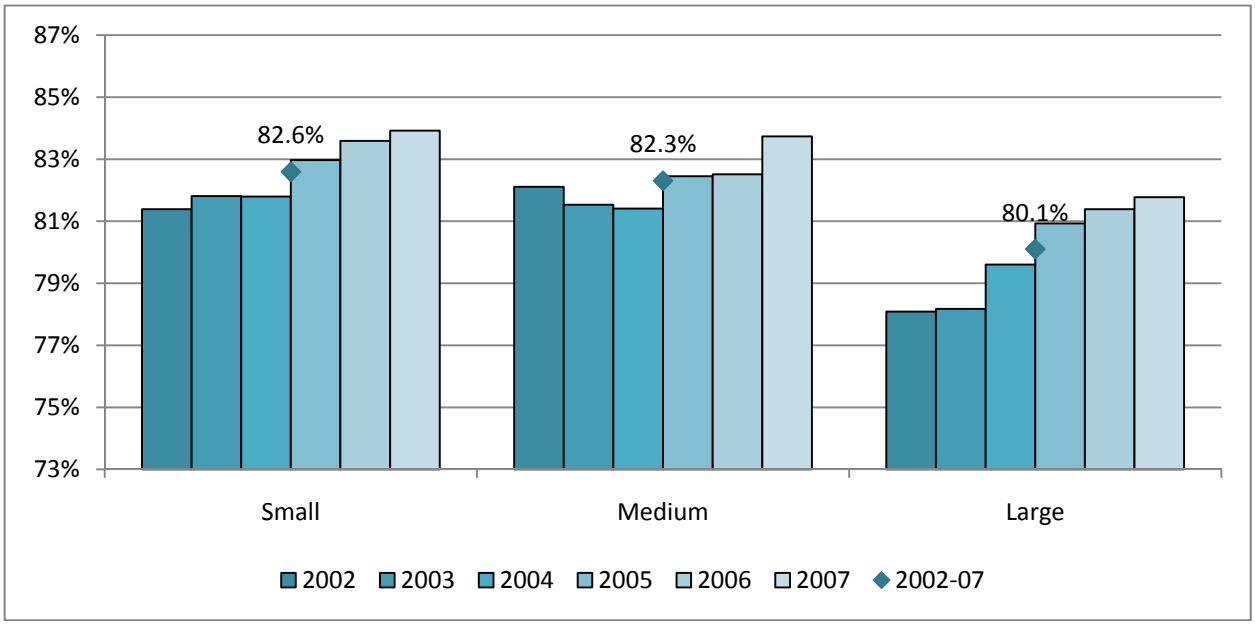


Figure 10. Percentage of graduates satisfied or very satisfied by Ontario region, 2002-2007

[11] 1,719 observations with missing gender were excluded from our analysis.

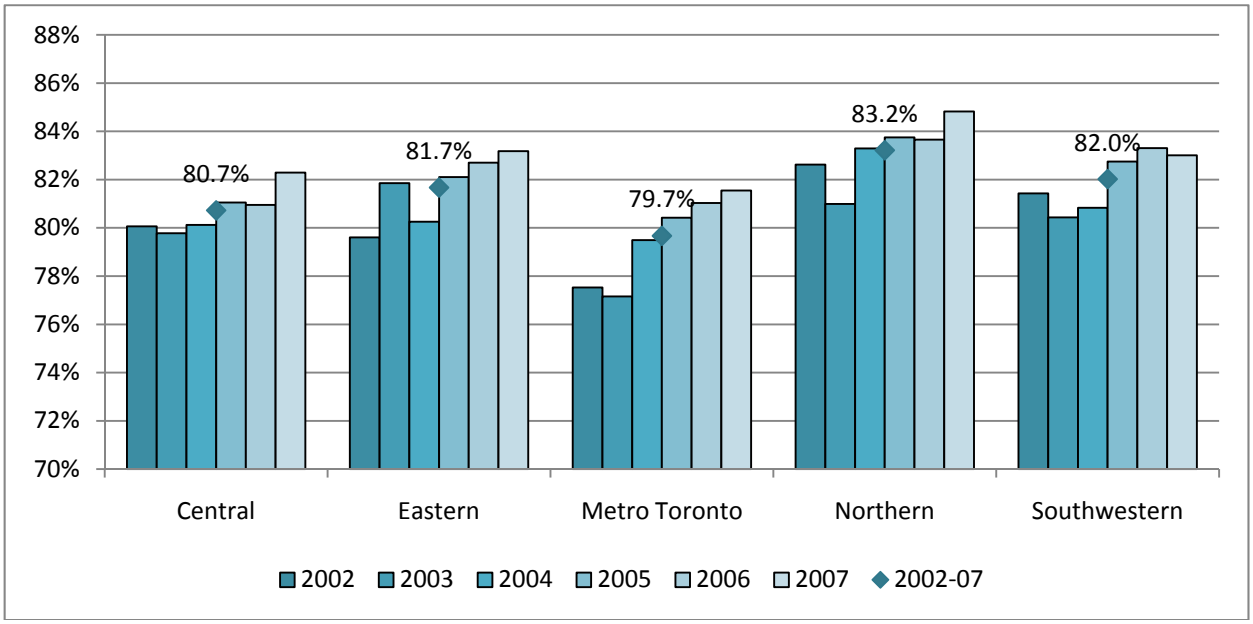


Figure 11. Percentage of graduates satisfied or very satisfied by field of study, 2002-2007

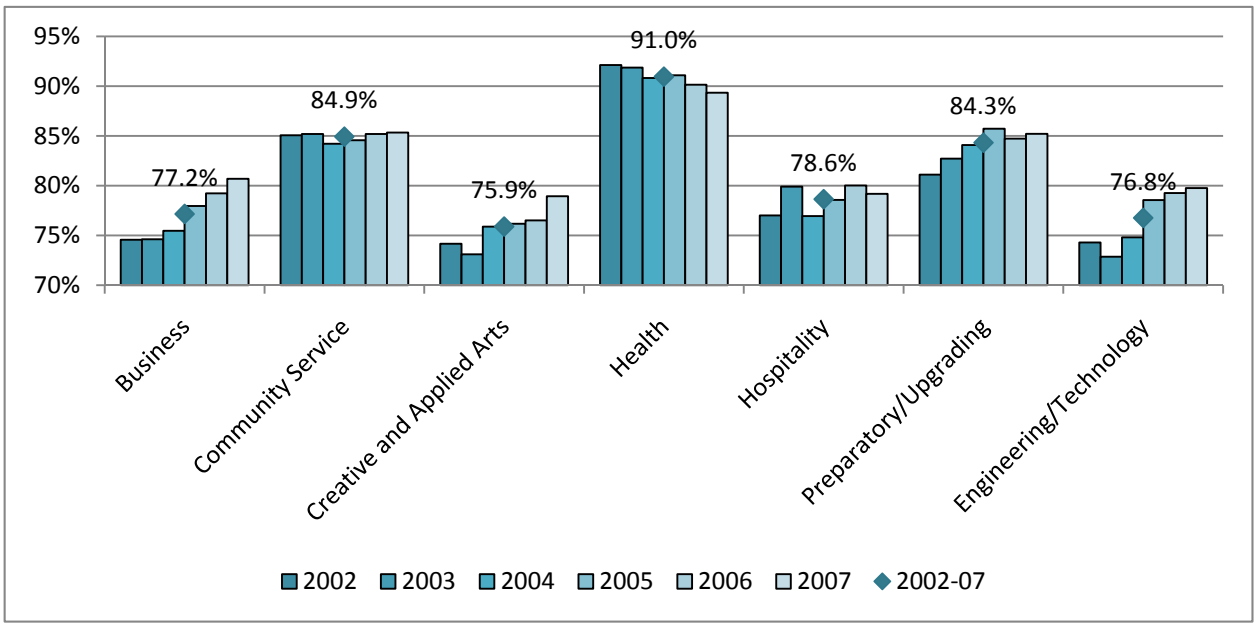


Figure 12. Percentage of graduates satisfied or very satisfied by credential attained, 2002-2007

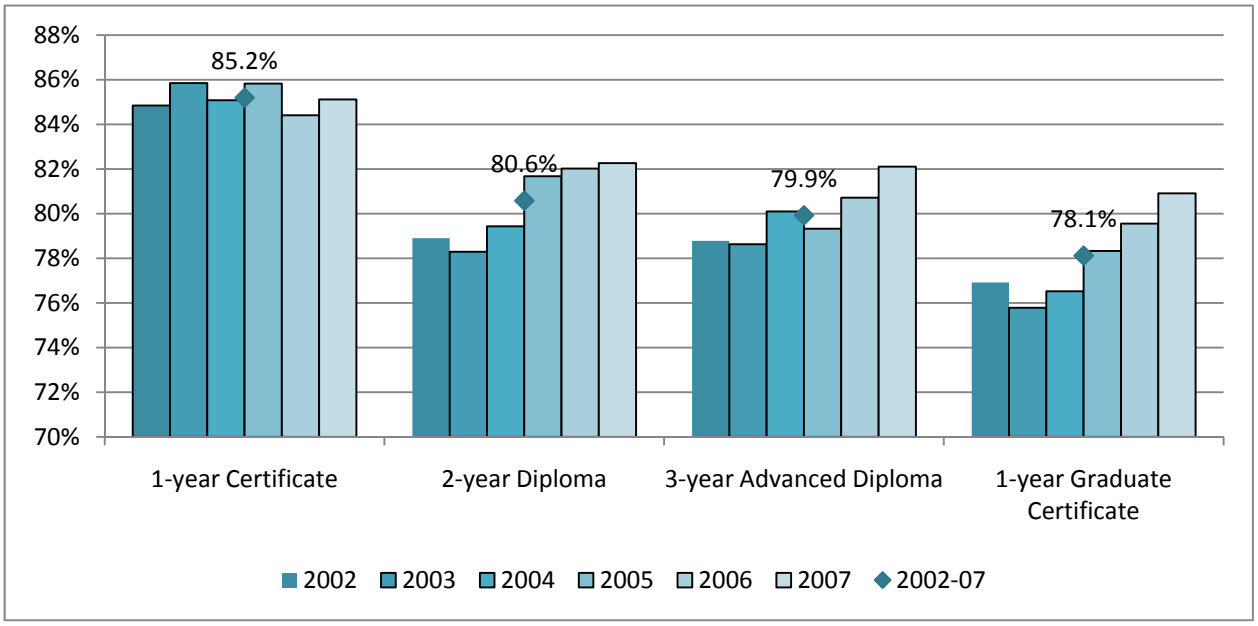
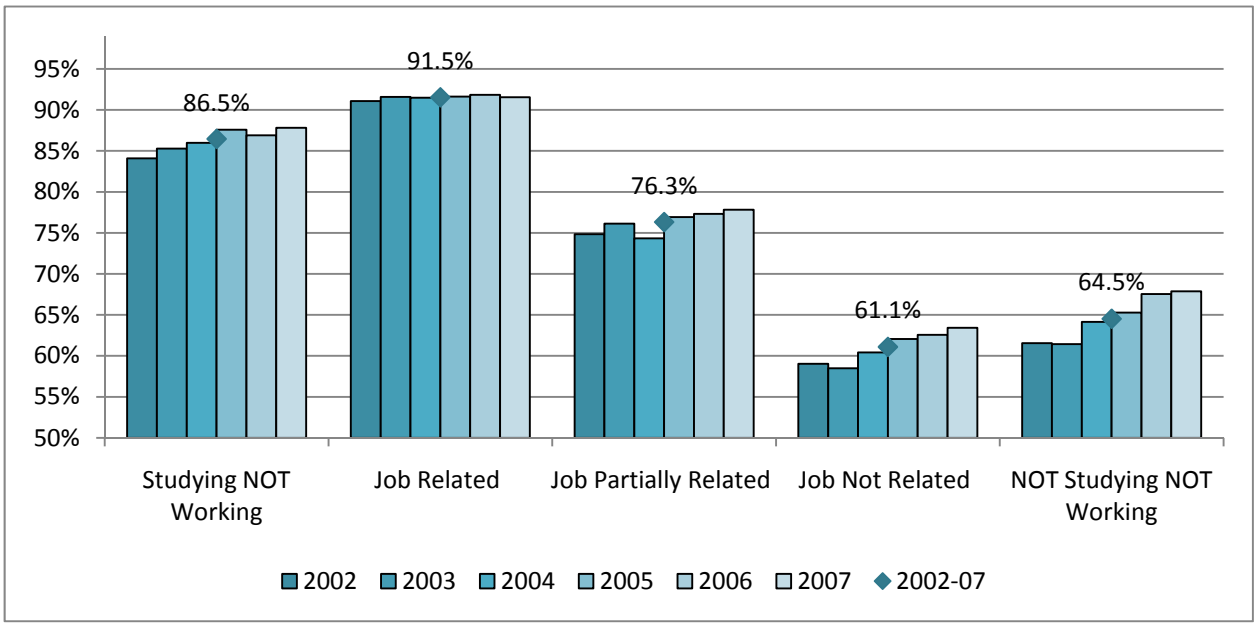


Figure 13. Percentage of graduates satisfied or very satisfied by graduates' current status, 2002-2007[12]



Regression Analysis

[12] 1,705 graduates who indicated they were employed but did not answer the question on job- relatedness were excluded.

One of the major drawbacks in interpreting descriptive data is the inability to control for various overlaps among characteristics. For example, graduating from a health program, being female, obtaining a job in a related field, appear to be associated with higher graduate satisfaction. However, these factors often occur in conjunction with one another. To identify the independent impact of each factor, maximum likelihood logistic regressions were performed separately for each survey year from 2002 to 2007, with the dependent variable being whether graduates were satisfied or very satisfied with the usefulness of their college education for achieving their goals after graduation. All above factors were included in the model as regressors.[13]

The Wald Chi-Square tests show that this model as a whole is statistically significant, as compared to the model with no predictors. Although the model resulted in a fairly low pseudo R^2 of between 0.098 and 0.121 (Table 5), the results demonstrate that a graduate's field of study, credential type, and current studying/working status had a significant effect on their satisfaction. On the other hand, age, gender, institution size, and region of province cease to be consistently significant explanatory variables once all variables are entered. Appendix 3 contains the complete regression model.

Table 5. Regression model for graduate satisfaction rate: All graduates

	2002	2003	2004	2005	2006	2007
Number of observations	34,438	36,701	40,138	42,032	42,400	40,017
Pseudo R^2	0.1209	0.1304	0.1163	0.1112	0.1042	0.0974

A series of Wald Chi-Square tests were run to test the significance of the regressors, using 5% as the significance level. For field of study, graduates of community service, health, and preparatory/ upgrading programs were significantly more satisfied than business graduates (reference group) for all years (2002 to 2007), while engineering/technology, hospitality, and creative and applied arts graduates were less satisfied for most years.

Controlling for all other factors, graduates with a 1-year certificate were more satisfied than other credential holders. One-year graduate certificate holders were significantly less satisfied than 2-year

[13] The regressions with and without interact terms between age and gender were both performed resulting in similar effects. Therefore, the analysis in this paper is mainly based on regressions without the interact terms. Additionally, a general ordinal logistic model was conducted to demonstrate that factors influencing each specific level of satisfaction (from very dissatisfied to very satisfied) were similar to the maximum likelihood logistic model described in the text. These results are available from the authors.

diploma holders (reference group) for most years, while 3-year advanced diploma holders were not significantly different from 2-year diploma graduates for most years, with the exception of 2007.
As seen in the descriptive analysis, the graduates' current status, i.e., whether the graduate was currently studying, working in a related or unrelated field, or neither working nor studying, was a significant contributor to graduate satisfaction for all years. As expected, graduates working at related jobs were the most satisfied. Graduates working at partially related jobs were significantly less satisfied than graduates studying and not working, but significantly more satisfied than graduates working at a non-related job or not studying and not working. Graduates working at a non-related job were the least satisfied.[14]

Age and gender had an inconsistent effect on graduate satisfaction over the years analyzed. Graduates older than 25 years of age were significantly less satisfied than graduates younger than 22 years of age for most years. Male graduates were significantly less satisfied than female graduates from 2002 to 2004, but the difference became insignificant after 2004.

In contrast to the descriptive graphs shown previously, when holding all other variables constant, college size and college region have no significant effect on graduate satisfaction for most years. Specifically, the regression model shows that there is no evidence that graduates from metro Toronto colleges were less satisfied than other college graduates or that graduates of large colleges were less satisfied. The differences in satisfaction seen in the descriptive data relating to college size and region are likely a result of the fact that metro Toronto colleges have proportionally fewer graduates with characteristics that were more likely to feel satisfied, and more graduates with characteristics that were less likely to feel satisfied. For example, in 2007, colleges in metro Toronto had fewer graduates of health and community service, and much more business and hospitality graduates (Table 6). Additionally, metro Toronto colleges also had a higher proportion of graduates from 1-year graduate certificates (13% versus 8% overall), and fewer graduates of one year certificate programs (14% versus 18%). Moreover, metro Toronto graduates were less likely to be studying and not working (21% versus 23%), but more likely to be neither studying nor working (11% versus 8%).

[14] These results were tested using Wald Chi-Square.

Table 6. Characteristics of college graduates by region (2006-2007) (% of graduates)

	Central	Eastern	Metro	Northern	Southwest	Total
Age						
Under 22	30.91	34.41	***19.44***	36.87	32.63	28.82
Between 22 and 25	43.05	35.06	41.83	32.3	43.08	40.17
Older than 25	26.03	30.53	***38.73***	30.82	24.3	31.01
Field of Study						
Business	24.05	17.12	***30.45***	13.05	21.56	23.33
Community Service	22.27	24.52	***17.29***	21.55	17.97	20.32
Creative and Applied Arts	15.8	10.77	13.61	5.45	9.48	12.14
Health	11.36	14.47	***10.15***	15.91	14.26	12.47
Hospitality	3.18	5.44	***7.05***	3.12	3.19	4.81
Preparatory/Upgrading	6.13	6.31	6.49	9.26	13.38	7.79
Engineering/Technology	17.22	21.37	***14.95***	31.65	20.16	19.15
Credential Type						
1-year Certificate	15.24	18.79	***13.76***	30.08	23.46	18.23
2-year Diploma	48.2	60.72	47.98	51.51	47.23	50.56
3-year Advanced Diploma	25.44	15.83	23.66	15.77	25.59	22.23
1-year Graduate Certificate	9.86	4.36	***13.39***	2.64	3.62	8.24
4-year Degree	1.25	0.3	1.21	0	0.1	0.75
Current Status						
Studying NOT Working	21.79	23.15	***20.72***	31.48	26.63	23.45
Job Related	43.89	43.76	42.73	39.1	41.17	42.58
Job Partially Related	7.64	6.81	7.91	5.58	7.25	7.31
Job Not Related	19.56	19.07	17.96	16.27	18.48	18.47
NOT Studying NOT Working	7.13	7.21	***10.68***	7.57	6.47	8.2

Overall, the regression results for graduate satisfaction indicated the following:

- Graduate satisfaction increased between 2002 and 2007.
- Despite the descriptive data results, college graduates from metro Toronto were not significantly less satisfied than graduates from other regions.
- Health graduates were the most satisfied among all fields of study.
- One year certificate holders were more satisfied than other credentials.

- Graduates working at related job were the most satisfied, followed by those studying not working. Graduates working at unrelated jobs were the least satisfied.
- Although these factors do have effects on college graduate satisfaction, the low pseudo R^2 (around 0.1) shows that they are not able to explain all of the variance in the satisfaction of college graduates with the usefulness of their college education for achieving their goals after graduation.

Research conducted in British Columbia on college and institute graduates showed some similar results (CISO, 2007). The outcome variable used in that survey was "success", determined from the questions of "How satisfied are you with the education you received?" and "To what extent did you achieve your most important objective for enrolling?" As seen in the present analysis of Ontario graduates, the descriptive data indicated that gender and age affected the satisfaction score, however, the effect disappeared in their stepwise regression model. Factors such as obtaining a job related to the graduates' program or entering further education, were significant, as well as program factors such as teaching and curriculum. Due to the survey design in the Ontario college graduate survey, program factors were only asked of employed graduates and are described in a later section.

Graduates in the labour force

Graduates in the labour force were defined as graduates who indicated that they were "employed or self-employed", "not employed but had accepted a job to start shortly" or "not employed but looking for work" during the survey week. Graduates not in the labour force were graduates currently studying full-time or graduates who were neither employed nor looking for work during the survey week. In the past six years, the labour force participation rate[15] decreased from 79% for 2002 to 75% for 2007, mainly due to an increase in graduates returning to full-time education.

Of graduates who indicated that they were unemployed but looking for work, almost half listed "not enough jobs", "not enough jobs were available where I can use my training" or "available jobs required more work experience" as their main reasons for unemployment. Salary and relocating considerations were of minimal importance (Table 7).

[15] Participation rate = graduates in labour force / respondents in the survey.

Table 8 contains the responses for those who indicated they were not looking for work. The most mentioned reasons for not looking for work were health and family responsibilities. Conversely, "no jobs in field" was the least listed reason for not looking for work.

Table 7. Reason for unemployment[16]: Percentage of those looking for work

	2002	2003	2004	2005	2006	2007	2002-2007
Not enough jobs were available	27.35	24.99	23.62	20.7	18.32	16.62	22.28
Available jobs required more work experience than I have	13.82	16.81	16.17	12.13	12.47	13.64	14.29
Not enough jobs were available where I can use my training	13.59	12.8	12.99	13.5	12.81	12.68	13.07
Don't know/no reason	6.33	5.98	7.06	7.55	6.64	7.84	6.86
Laid off/downsized	5.55	4.67	4.04	4.58	4.8	4.42	4.68
On vacation/travelling	1.99	1.88	2.02	3.68	3.54	3.94	2.76
Training was not adequate to meet requirements of available jobs	2.75	2.08	2.52	2.43	3	2.49	2.53
Caring for children/pregnant	1.56	1.65	2.27	1.93	2.49	2.27	2.01
Still in school	1.65	1.23	1.63	2.06	2.28	2.6	1.86
Jobs with suitable pay were not available	1.36	0.83	1.16	1.22	1.46	1.64	1.26
Unable or unwilling to leave the area	0.69	1.03	1.41	1.12	1.43	1.9	1.24
Other	22.99	25.62	24.65	28.37	30.01	29.56	26.63
Total Responses	3,459	3,509	3,611	3,207	2,936	2,690	19,412

[16] Question: "What is the main reason that you were not employed?" This question was only asked of graduates who were "not employed, but looking for a job".

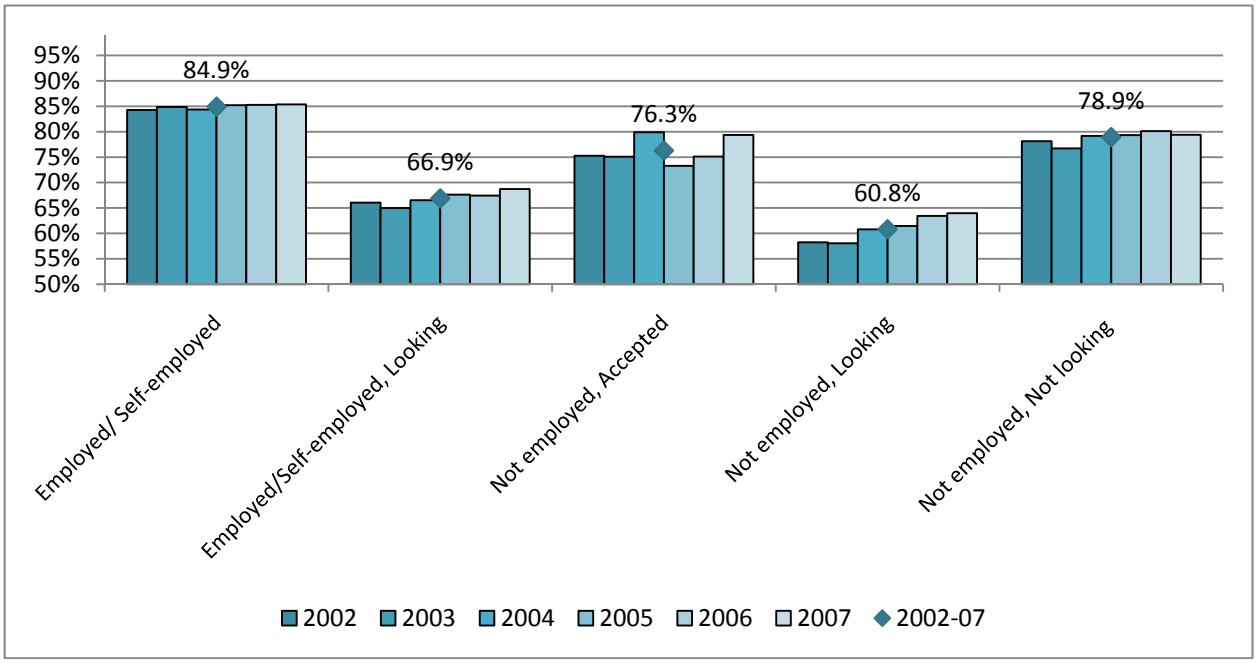
Table 8. Main reason for not looking for employment[17]

	2002	2003	2004	2005	2006	2007	2002-2007
Personal health or maternity leave	19.6	20.9	21.1	17.8	19.5	18.0	19.4
Personal or family responsibilities	18.1	15.7	18.3	16.5	19.1	17.7	17.6
Want to travel/on vacation	8.3	6.7	6.4	12.6	10.2	11.6	9.5
Continuing with studies/full-time	8.6	6.1	9.0	8.9	9.4	11.4	9.0
Part-time studies	7.3	7.9	8.7	7.9	8.1	6.6	7.7
No particular reason/don't know	4.6	5.8	6.2	5.0	4.5	6.1	5.4
Moving/relocating	2.1	3.0	3.5	3.0	3.0	2.9	2.9
Not permitted to work/on student visa authorization	1.9	1.9	1.7	2.2	2.7	2.0	2.1
No jobs in field	2.2	2.3	1.3	1.8	1.0	1.2	1.6
Refused or missing	0.9	0.6	0.8	0.8	1.1	0.6	0.8
Other	26.9	29.2	22.9	23.9	22.0	21.9	24.2
Total Responses	810	861	979	1048	1051	1091	5840

To understand how labour market status can affect graduate satisfaction, Figure 14 shows, as would be expected, that graduates who are employed and not looking for jobs appeared to be the most satisfied, while graduates who are unemployed but looking for jobs were the least satisfied. It is interesting to note that graduates who are working but still looking for another job were much less satisfied than graduates who were not working and not looking for work. There is little evidence that graduates not looking for work are disillusioned with the job market, as indicated by the finding mentioned above that "no jobs in field" was the least listed reason for those not looking for work (health or personal reasons were the most common), and their satisfaction rating was moderate, at 79%.

[17] Question: "What was the main reason you were not looking for employment?" This question was only asked of graduates who were "not employed, but not looking for a job."

Figure 14. Graduate satisfaction by employment status



Influences on Employment Rate: Descriptive Analyses

Table 9 shows the employment rate of graduates by gender, age, funding, college size, region, field of study, and credential.[18] The employment rate has been steadily increasing since 2002 for almost all groups, averaging around 90% employment.

Older graduates and male graduates appeared to have lower employment rates than younger graduates and female graduates. International graduates appeared to have the lowest employment rate; however this has been increasing dramatically.[19] Graduates from health programs consistently had the highest employment rate, averaging around 95%, followed by community service, hospitality, creative and applied arts, engineering/technology, and business. Graduates of 1-year certificate programs once had the highest employment rates; however the employment rates of graduates with other credential types have been increasing, such that the gap between credentials has narrowed over those years.

[18] The employment rate discussed here is defined differently from MTCU's "Employment Profile". In our analysis, employment rate was defined as graduates employed or "not employed but had accepted a job to start shortly" as a proportion of graduates in the labour force.
[19] This may be tied to a Citizenship and Immigration (CIC) policy change that lengthened the duration that international students could work in Canada after graduation.

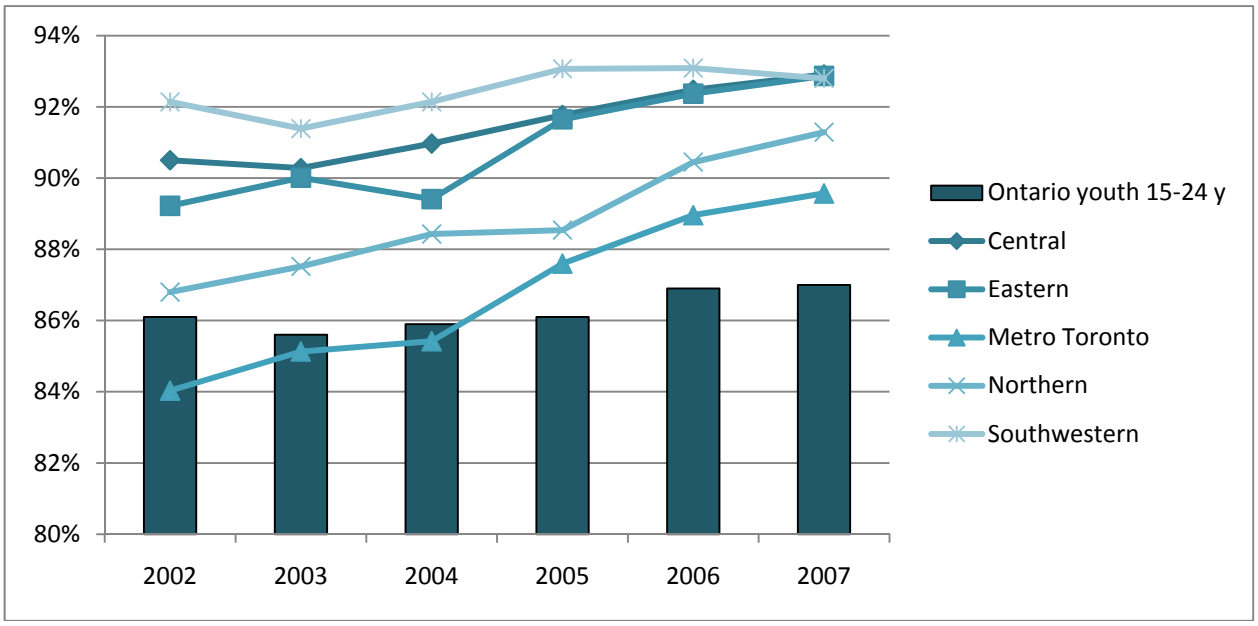
Table 9. Employment rate by graduate characteristics, 2002-2007

	2002	2003	2004	2005	2006	2007	2002-2007
Total in Labour force	29,300	30,729	32,602	33,370	33,673	32,259	191,933
Total Employment Rate	88.19	88.58	88.92	90.39	91.28	91.66	89.89
Age							
Under 22	91.14	91.21	92.16	93.04	93.62	93.93	92.66
Between 22 and 25	89.47	89.82	90.21	91.58	92.09	92.32	90.95
Older than 25	85.23	85.82	85.56	87.01	88.45	89.26	86.86
Gender							
Female	89.93	90.15	90.12	91.22	92.04	92.6	91.01
Male	85.57	86.23	87.11	89.27	90.27	90.45	88.29
Funding							
International	69.29	74.32	77.21	85.01	86.76	87.53	82.98
Ministry	88.33	88.74	89.05	90.5	91.38	91.77	90.01
Other	89.52	88.31	91.58	90.91	96.75	93.14	90.76
College Size							
Small	88.4	88.7	89.34	89.92	91.47	92.15	89.99
Medium	90.46	90.9	91.23	92.41	92.69	92.81	91.78
Large	86.98	87.35	87.67	89.36	90.55	91.02	88.89
College Region							
Central	90.5	90.28	90.97	91.77	92.48	92.91	91.5
Eastern	89.22	90.01	89.41	91.65	92.37	92.87	90.97
Metro Toronto	84.03	85.13	85.42	87.6	88.96	89.57	86.89
Northern	86.8	87.52	88.43	88.54	90.45	91.29	88.85
Southwestern	92.14	91.39	92.14	93.07	93.09	92.8	92.46
Field of Study							
Business	83.76	84.73	84.92	88.18	89.28	89.7	86.81
Community Service	91.78	91.52	91.62	92.45	93.2	93.63	92.43
Creative and Applied Arts	85.7	87.03	87.91	89.73	90.26	90.53	88.67
Health	95.35	95.28	93.68	93.08	94.49	95.1	94.45
Hospitality	90.06	89.49	90.77	91.45	92.14	92.27	91.1
Preparatory/Upgrading	83.06	83.9	89.19	85.62	89.29	85.73	86.44
Engineering/Technology	85.39	85.14	86.08	89.41	90.03	90.9	87.97
Credential Type							
1-year Certificate	90.24	90.59	88.74	89.93	91.12	90.99	90.26
2-year Diploma	87.67	88.1	89.31	90.78	91.61	92.01	90.06
3-year Advanced Diploma	88.65	89.11	89.01	90.5	91.03	91.39	89.9
1-year Graduate Certificate	86.27	85.81	86.81	88.53	90.19	91.35	88.28
4-year Degree	--	--	--	--	--	91.47	91.47

On a regional basis, while graduates from metro Toronto colleges appeared to have the lowest employment rate, the employment rate for graduates from metro Toronto as well as northern Ontario has been increasing (Figure 15). Employment trends in Ontario over the same time period show some similar

patterns, with overall unemployment (as a proportion of the labour force) being higher in northern Ontario and Toronto than the rest of the province (Figure 16). However the employment rates have been increasing demonstrating the effect of local employment conditions on employment rates of college graduates.

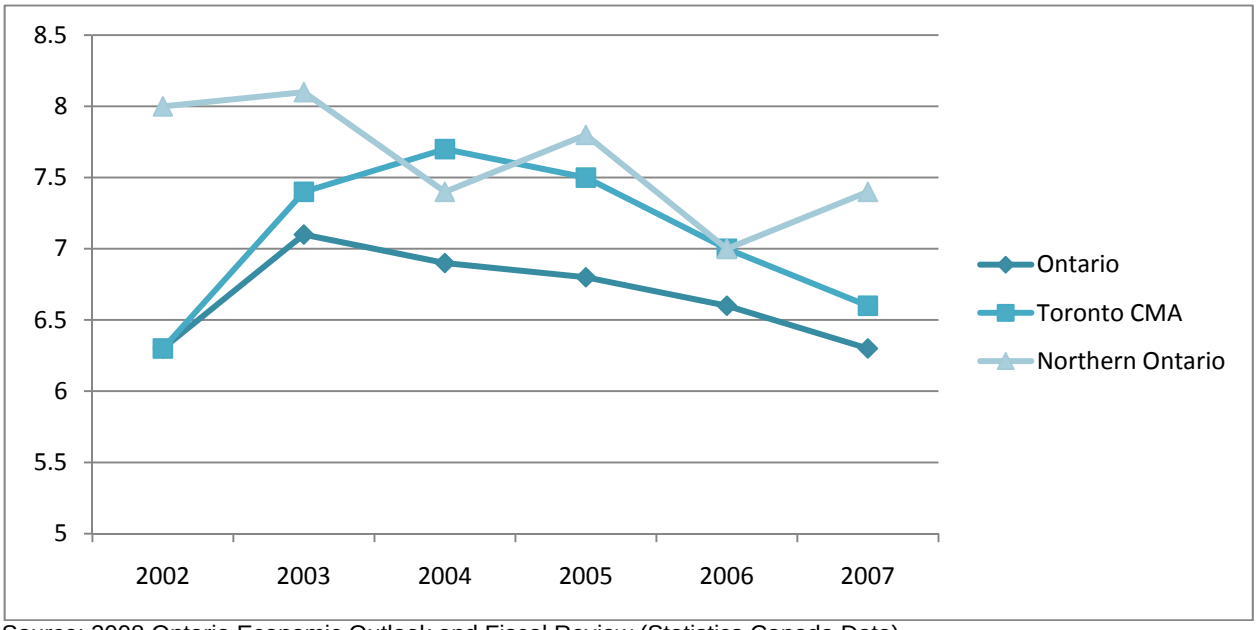
Figure 15. Employment rate by region for Ontario college graduates relative to the employment rate for Ontario youth aged 15-24[20]



Source: Labour Force Survey, Statistics Canada (Ontario employment rates for 15-24 yr olds); Current Graduate survey analysis for college graduate employment rates.

[20] Employment rate here is calculated as the per cent of the labour force working full- or part-time The age category of 15-24 year olds was used as a comparison since approximately 60 per cent of graduates are under age 25.

Figure 16. Unemployment rate in Ontario and select regions, 2002-2007



Source: 2008 Ontario Economic Outlook and Fiscal Review (Statistics Canada Data)
http://www.fin.gov.on.ca/en/budget/fallstatement/2008/08fs-ecotables.html#table3

Influences on Employment Rate: Regression Analyses

Maximum likelihood logistic regressions were performed for graduates' employment[21] each year from 2002 to 2007. The Wald Chi-Square tests had a p-value of 0, showing that this model was useful overall, compared with the model with no regressors. However, the model resulted in a pseudo R^2 of only between 0.02 and 0.05 depending on the year of graduation, indicating that this model as a whole was fairly weak in explaining the variance of employment (Table 10, Appendix 4). Nevertheless, factors having a significant effect on the employment rate included age, gender, region, field of study, and credential type. As also seen in the descriptive data, the regression analysis showed that being male, and being older each had a negative impact on employment. In addition, relative to the metro Toronto region, graduates of the southwestern, central, and eastern regions were more likely to be employed, with the northern region not significantly different.

[21] The dependent variable is an employment dummy, which is 1 if the graduate was employed or "not employed but had accepted a job to start shortly" at the survey time, 0 if otherwise in labour force.

Table 10. Regression model for employment rate

	2002	2003	2004	2005	2006	2007
Number of observations	28,760	30,486	32,361	33,129	33,368	31,814
Pseudo R^2	0.0517	0.0456	0.0396	0.0284	0.0241	0.0258

Graduates from health, community service, and hospitality were more likely to be employed, in relation to business fields, with health graduates having the highest employment rate among all graduates. When other factors are controlled for, in contrast with the descriptive analysis, graduating with a 1-year certificate had a significantly negative effect on employment, relative to 2-year diplomas, whereas attaining a 3-year advanced diploma was a positive influencer in the job market. Since 2006, 1-year graduate certificates have resulted in increased employment. There was no evidence that either funding or college size had a significant effect on graduates' employment rate.

Employed Graduates

Descriptive Profile

Employed graduates were defined as graduates at the time of the survey who were currently employed or had ever been employed since graduation.[22] The following is an overall summary of the nature of employment of college graduates between 2002 and 2007, six months after graduation.

- For graduates who provided a current location, 95% were working in Ontario.
- About 15% of employed graduates had more than one job at the time of the survey.
- More than two-thirds of employed graduates were permanent employees; almost one-quarter were casual or contract employees (Table 11).
- Over 70% of employed graduates worked at jobs related to the program they graduated from, however this varied greatly depending on the field of study (Table 12) and the credential obtained (Table 13). Specifically, health graduates were the most likely to find related jobs, and as would be expected, graduates of preparatory programs were the least likely to find related jobs. Focusing on 2007, the year of the first cohort of college degree graduates, graduates of 1-year certificate programs were the least likely to work in related jobs (due, in part, to the high

[22] Graduates "not employed but had accepted a job to start shortly" were excluded from the salary analysis even if they had been employed since graduation, since those graduates were not asked their number of hours worked per week, necessary in calculating hourly salary. Those graduates only account for 1% per cent of graduates in labour force.

proportion of preparatory 1-year certificates), whereas graduates of degree programs were the most likely to find work in a field related to their area of study.

- Over 83% of employed graduates were working full-time at the time of survey (Table 14). Interestingly, more than a quarter of health graduates worked at part-time jobs, which is the highest among all fields of study except preparatory programs, with engineering/technology fields having the highest proportion of full-time workers. "Could only find part-time work" was the most mentioned reason for working part-time, which accounts for more than one third of those working part-time on average from 2002 to 2007.

Table 11. Nature of employment of college graduates, 2002-2007

	2002	2003	2004	2005	2006	2007	2002-2007
Total employed[23]	27,660	29,132	30,969	32,103	32,531	31,321	183,716
Employment type (%)							
Permanent employee	69.71	68.96	69.53	68.4	67.98	66.98	68.56
Self-employed	2.48	2.79	2.59	2.83	3.04	2.94	2.79
Freelance	0.76	0.88	0.8	1.11	1.01	1.09	0.95
Contract employee	12.77	12.28	11.92	12.96	13.48	13.76	12.88
Temporary/ occasional or on-call employee	11.33	11.78	11.62	10.97	10.59	10.7	11.15
Seasonal or summer employee	2.25	2.5	2.77	3.04	3.24	3.6	2.92
Elect-to-work employee	0.12	0.15	0.14	0.12	0.1	0.09	0.12
Refused	0.21	0.27	0.22	0.18	0.18	0.35	0.24
Missing	0.37	0.4	0.39	0.38	0.38	0.49	0.4

[23] Employed/ever employed graduates here include graduates "not employed but had accepted a job to start shortly" within six months after graduation.

Table 12. Percentage of employed graduates working in a related job by field of study (2002-2007 average)

	Related	Partially Related	Not Related	Total
Business	52.87	14.94	32.18	100
Community Service	61.67	7.81	30.51	100
Creative and Applied Arts	52.37	8.98	38.65	100
Health	85.69	2.71	11.61	100
Hospitality	62.73	10.48	26.78	100
Preparatory/Upgrading	9.5	8.76	81.74	100
Engineering/Technology	57.82	12.38	29.8	100
Total	60.91	9.79	29.3	100

Table 13. Percentage of employed graduates working in a related job by credential (2006-2007)

	Related	Partially Related	Not Related	Total
1-Year Certificate	59.68	6.15	34.18	100
2-Year Diploma	58.84	9.76	31.39	100
3-Year Advanced Diploma	63.91	11.41	24.68	100
1-Year Graduate Certificate	65.16	10.58	24.25	100
4-Year Degree	68.68	14.95	16.37	100
Total	60.91	9.79	29.3	100

Table 14. Percentage of employed graduates working full- or part-time by field of study (2002-2007 average)

	Full-time	Part-time	<30hr but Full-time	Total
Business	87.9	11.8	0.4	100
Community Service	78.7	20.5	0.9	100
Creative and Applied Arts	81.7	17.7	0.6	100
Health	72.8	26.3	0.9	100
Hospitality	86.4	13.0	0.6	100
Preparatory/Upgrading	72.6	26.6	0.9	100
Engineering/Technology	93.3	6.5	0.2	100
Total	83.3	16.2	0.6	100

Education Required for Job

An additional key question asked of employed graduates was the educational level required for their current job.[24] Around 60% of employed graduates were working in jobs requiring more than a high school education, a proportion that has varied little in the past five years (Table 15). Graduates of 1- year certificate programs are over-represented in jobs requiring high school or less, with college degree graduates the least likely to be over-represented (Table 16). As would be expected, graduates working in jobs requiring postsecondary credentials are most likely to be in a job related to their program of study (Table 17). Graduates who are in jobs related to their field of study but at a high school level may have a job in the industry they graduated from, but not the occupation, which may be common in some industry's entry level positions.

Table 15. Educational requirement for job at entry, %[25]

	2002	2003	2004	2005	2006	2007	2002-2007
High School or less	21.45	22.86	23.67	25.05	25.55	23.36	23.73
Partial PSE	9.18	8.35	8.28	7.64	8.41	6.64	8.06
Diploma/Certificate/Trade	47.05	46.48	47.55	46.17	46.18	46.58	46.66
Complete Degree	2.54	2.46	2.24	2.93	2.97	4.51	2.96
Other skills or Co-op placement	5.41	5.68	4.75	4.3	3.9	4.07	4.65
Don't know/None specified	14.38	14.17	13.51	13.91	12.99	14.83	13.95

[24] Interpretation of the relatedness of the educational requirement for a job and the graduates' credential is complicated by the lack of data in the survey on the previous credentials graduates may have attained.

[25] The job requirement grouping is as follows:
High School: Some high school, High school diploma/certificate
Partial PSE: Some postsecondary education, Some trade or vocational, Some college, CEGEP or similar institution including nursing school, Some university
Diploma/Certificate/Trade: Trade or vocation diploma/certificate, Diploma or certificate from college, CEGEP or similar institution including nursing school, University diploma or certificate below bachelor's level
Complete Degree:; Degree, level not specified; Bachelor's degree (eg. B.A., B.Sc., B.Ed.); Master's degree or higher
Others: Other, other general job skills, Co-op placement
Don't Know/ none specified: No qualifications specified, Refused, Don't know

Table 16. Educational requirement for job at entry by credential type, % (2006-2007)

	1 Year Certificate	2 Year Diploma	3 Year Advanced Diploma	1 Year Graduate Certificate	Degree	Total
High School or less	35.06	25.70	19.44	9.99	12.14	23.56
Partial PSE	6.01	6.47	7.63	6.67	7.86	6.70
Diploma/Certificate/Trade	36.39	47.73	52.35	46.25	34.29	47.03
Complete Degree	1.23	2.16	3.82	22.13	21.43	4.97
Other skills or Co-op placement	5.17	3.99	3.99	3.45	8.57	4.10
Don't Know/ none specified	16.14	13.95	12.78	11.51	15.71	13.64

Table 17. Percentage of graduates working in a job related to their field of study by educational requirement for job (2002-2007)

Job requirement	Related	Partially Related	Not Related	Total
High School or less	24.78	11.09	64.13	100
Partial PSE	69.53	12.51	17.97	100
Diploma/Certificate/Trade	84.79	7.76	7.45	100
Complete Degree	72.66	11.54	15.8	100
Other skills or Co-op placement	47.5	11.6	40.9	100
Total	64.38	9.46	26.16	100

Research into whether Canada's increasingly educated workforce has the right education and skills for the existing labour market has garnered much attention. Research looking at past cohorts (1982, 1986, and 1990) from Statistics Canada's National Graduate Survey showed that two years after graduation 37% of Canadian college graduates and 29% of university bachelor's graduates were in a job requiring less education than they had attained (Frenette, 2004). Other graduate surveys in other provinces contain similar rates. In Saskatchewan, the class of 2004-05 was asked about the minimum level of education required for their main job when they started. It was found that 19% of bachelor 's graduates were in a job that required high school/partial PSE or less, and between 33% and 45% of graduates of diploma/certificate programs were in a job requiring "some postsecondary" or less (Insightrix Research Inc., 2007). Additionally, in a Statistics Canada study using data from the Survey of Labour and Income Dynamics (SLID) from 1993 to 2001, it was found that almost half of university graduates under 30 years of age had been, at some point during the six years studied, in a job requiring high school or less (Li et

al., 2006). However, the research showed far less prevalence in older age groups. Other research using the 2000 General Social Survey indicated that 25% of each of college and bachelor's graduates felt overqualified for their jobs (Crompton, 2002).

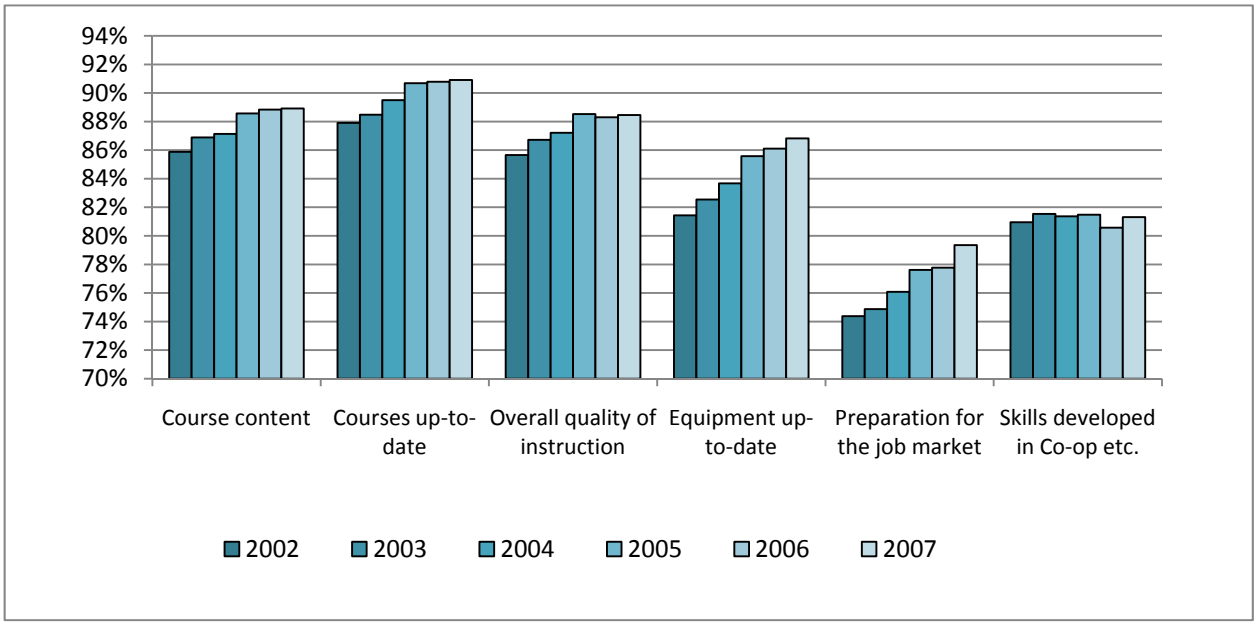
With respect to younger educated workers, theories for the mismatch include "career mobility" in which graduates work in jobs temporarily to gain skills such as work experience. It has also been put forth that younger graduates simply are inexperienced in finding the right job, and take time to find the right match, known as "matching theory" (Li et al., 2006). Whatever the cause, the present research demonstrates, as will be seen in a later section, that working in a job that requires a high school education or less has a negative impact on graduate satisfaction and earnings.

Educational Quality

In order to assess the link between educational quality and graduates' preparation for the labour market, employed graduates were also asked to indicate their satisfaction with how well various aspects of their program prepared them for their current job. These were primarily related to educational quality, including satisfaction with course content, whether courses were up-to-date, overall quality of instruction, whether the equipment was up-to-date, preparation for the job market, and finally, "skills developed in co-op, clinical, field placement experience, and career placement services". Additionally the graduates were asked in a separate question how helpful the skills developed in college were in getting their job (data not shown).[26] As shown in Figure 17, graduates' satisfaction with each aspect of their education is fairly high, and has been steadily increasing in most areas. Graduates are most satisfied with course material and instructional quality and least satisfied with how well their program has prepared them for the job market. However, the two aspects of their college program that had lower satisfaction levels, equipment and preparation for the job market, have also improved the most since 2002.

[26] Results are available from the authors.

Figure 17. Graduate satisfaction with various aspects of their college program[27]



Employability Skills

It is expected that all graduates with Ontario College credentials should be able to reliably demonstrate Essential Employability Skills.[28] There are six categories used by Ontario's Ministry of Training, Colleges and Universities which include personal skills, interpersonal skills, communication skills, numeracy, and critical thinking/problem solving/information management. Through the Graduate Satisfaction Survey, graduates' perceptions of the usefulness of and satisfaction with these skills in their current jobs are determined. The survey asked the graduates about 18 various skills and abilities, which tie in fairly well with the MTCU's employability skills.[29] For the current analysis 17 of these skills were clustered into five areas, which approximately correspond to employability skills including: personal/interpersonal skills,

[27] Q22: Thinking about the demands of this job, how satisfied are you with each of the following aspects of your program? *Please indicate if you are very satisfied (5), satisfied (4), neither satisfied nor dissatisfied (3), dissatisfied (2), or very dissatisfied (1).*
Q22a: course content
Q22b: courses were up-to-date
Q22c: overall quality of instruction
Q22d: equipment was up-to-date
Q22e: preparation for the job market
Q22f: skills developed in co-op, clinical, field placement experience, and career placement services Satisfaction % = number of graduates who were satisfied (4) or very satisfied (5) / all respondents.

[28] Ministry of Training, Colleges and Universities "Framework for Programs of Instruction".

[29] Employers are also provided with the same list of skills and abilities to evaluate their employees; however that data is not being analyzed in the present paper.

communication skills, preparation for a specific job, numeracy, and critical thinking/problem solving/information management. Moreover, the survey asked about additional skills related to "preparation for a specific job" which are not in the Essential Employability list, but are included in the current analysis. Table 18 contains the actual wording as provided in the survey and the groupings. To test the reliability of the category groupings, a factor analysis was performed yielding a Cronbach's alpha ranging from 0.78 to 0.85, indicating that the groupings were reasonably reliable.

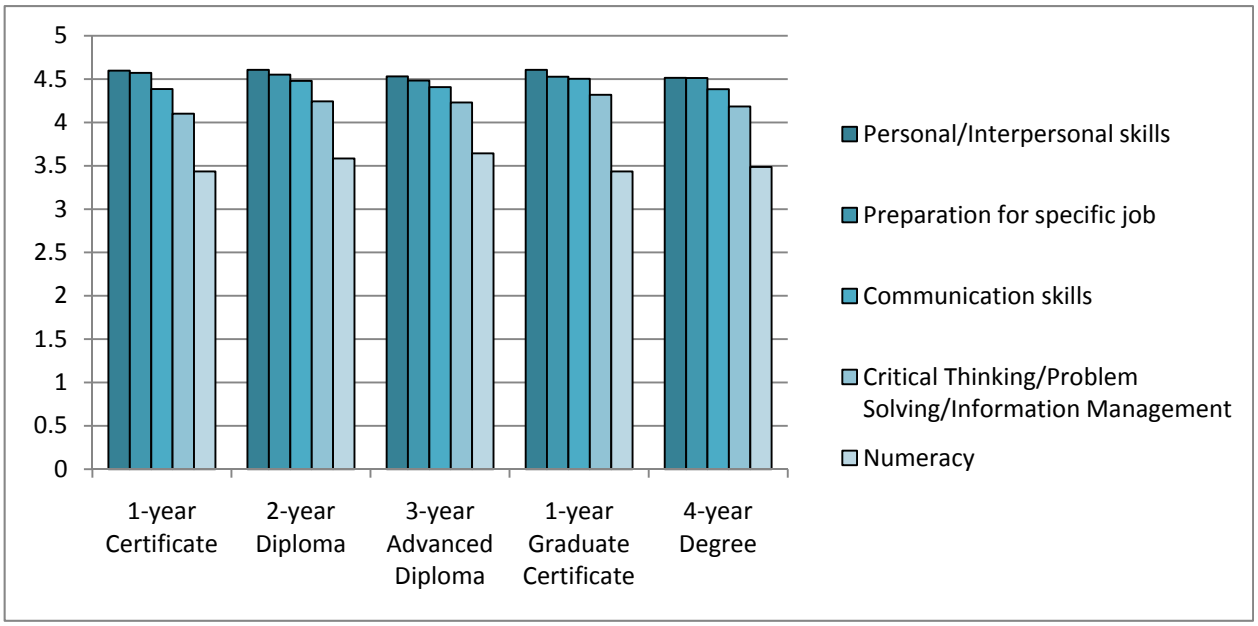
In Figure 18 and Figure 19, for graduates employed in a job related to their field of study, the importance of each of these skill groupings in their current job and their satisfaction with these skills are shown for the 2006-07 graduates. The focus in this analysis is on graduates who were working in an area related to their field of study for ease of interpretation. It is very interesting that across credentials, graduates rate employability skills such as personal/interpersonal skills, communication, and critical thinking/problem solving/information management (often considered "soft skills") as important as the specific job-related skills. The rated importance of numeracy skills was lower than the other skills, which may have been a function of the question asking specifically "math techniques" rather than overall numeracy. Figure 19 contains the graduates' satisfaction with each of these skills. There was very little difference between skills across credentials, with communication and numeracy skills being rated somewhat more highly across credentials. The impact of these skills on overall graduate satisfaction and earnings will be discussed in a later section.

Table 18. Grouping of graduates' skills and abilities[30]

Personal/ Interpersonal skills (alpha=.85)	Preparation for specific Job (alpha=.83)	Communication skills (alpha=.78)	Numeracy	Critical Thinking/ Problem Solving/ Information Management (alpha=.80)
Q. Adaptable Adapts to new situations and demands by applying and/or updating his/her knowledge and skills	**A. Specific job-related knowledge** Demonstrates conceptual knowledge related to the work	**C. Oral communication** Speaks in a clear, concise and correct manner	**F. Math skills** Applies math techniques with the accuracy required to solve problems and make decisions	**H. Critical thinking** Evaluates his/her own thinking throughout the steps and processes used in problem solving and decision making
L. Organization and planning Determines tasks and resources to complete project objectives	**B. Specific job-related skills** Uses specific technical skills related to the work being done	**D. Written communications** Writes in a clear, concise and correct manner		**I. Problem solving** Evaluates the validity of arguments based on qualitative and quantitative information
M. Time management Sets priorities and allocates time efficiently to complete several tasks within specific deadlines	**N. Quality of work** Performs tasks accurately and pays attention to detail	**E. Comprehension** Demonstrates understanding by restating information, ideas, concepts in different ways		**P. Creative and Innovative** Creates innovative strategies and/or products that meet identified needs
R. Responsible Takes responsibility for her/his own actions and decisions	**O. Productivity** Is productive in completion of tasks			**J. Research and analysis** Collects, analyzes, and organizes relevant necessary information
K. Teamwork Interacts with others in ways that contribute to effective working relationships and achievement of goals				

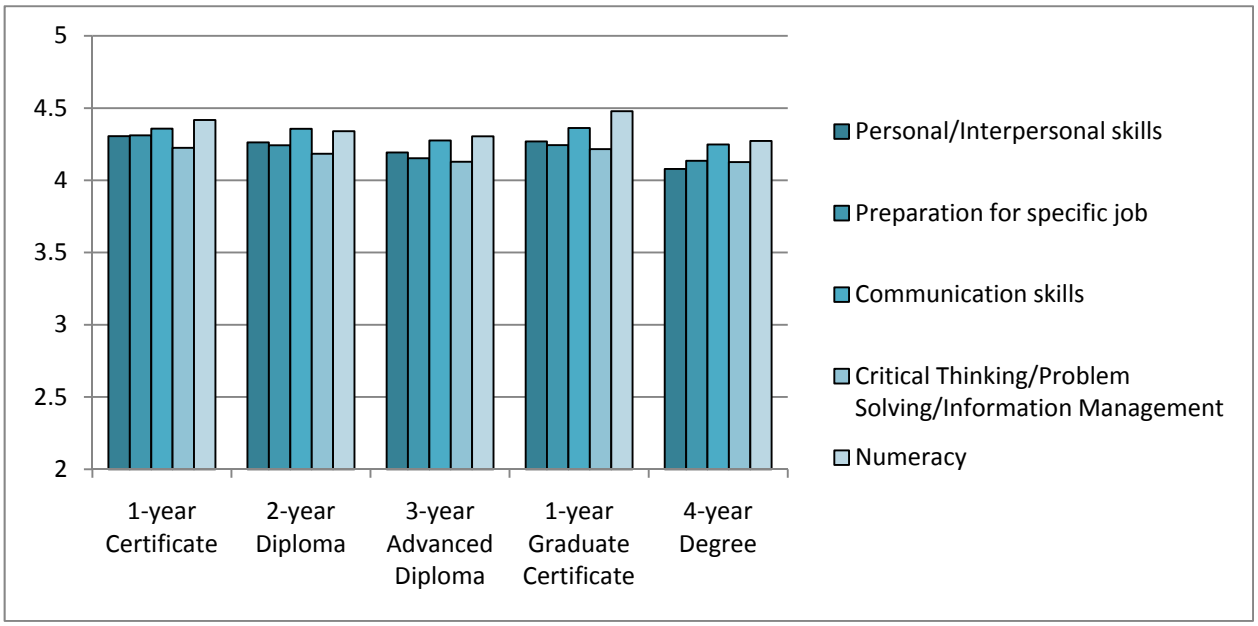
[30] Q32G. "Computer skills" was excluded because the question is ambiguous and it did not fit into any of the clusters created.

Figure 18. Importance of skills by college credential for graduates employed in jobs related to their field of study, 2006-2007[31]



[31] Importance is on a five-point scale, where (1) is not important, and (5) is very important. Likewise, the satisfaction scale is also a five-point scale, ranging from very dissatisfied (1) to very satisfied (5).

Figure 19. Satisfaction with skills by college credential for graduates employed in jobs related to their field of study, 2006-2007



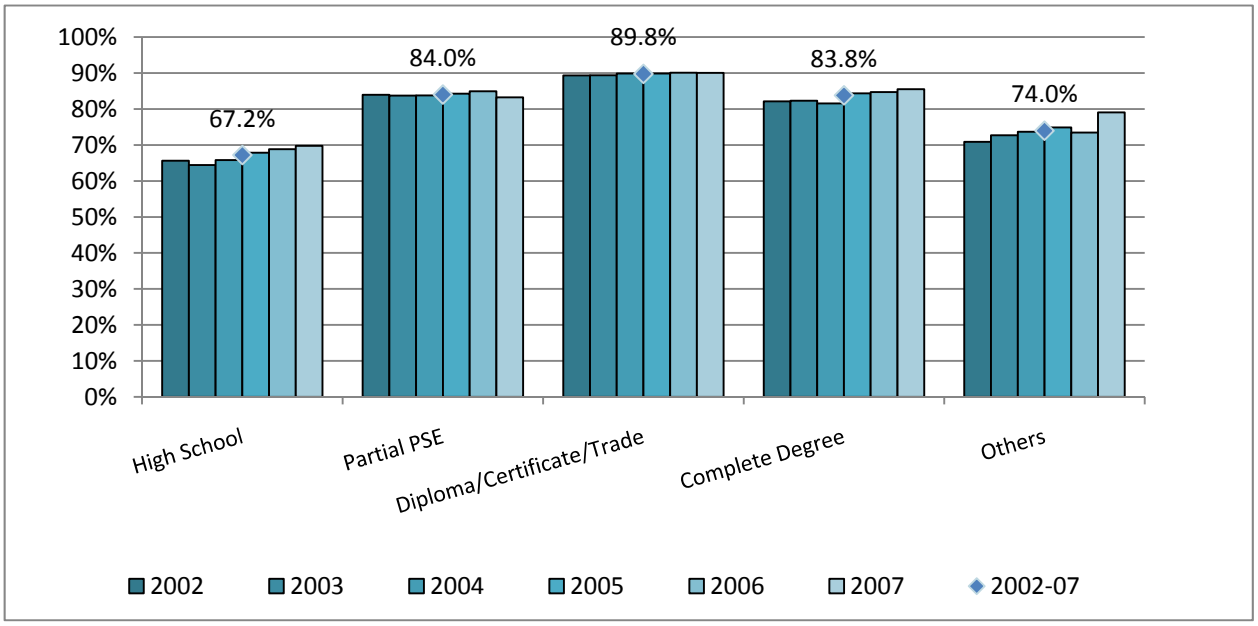
Influences on Satisfaction

In an earlier section, factors which influenced graduate satisfaction were determined for the entire survey population. In the current section, the analysis for the employed graduates is expanded to include additional questions related to their current job:

- Education required for job at entry
- Whether working full- or part-time
- Earnings from current job
- Satisfaction with various aspects of their college program (e.g., teaching quality, equipment, etc)
- Importance of and satisfaction with skills required for job (e.g., communication, interpersonal, etc)

The descriptive analysis shows that factors such as age, gender, and field of study had a similar effect on graduate satisfaction in the employed sub-group as in the whole survey population. Additionally, graduates working full-time appeared slightly more satisfied. Graduates working at jobs requiring education higher than high school appeared more likely to be satisfied (Figure 20), and graduates who obtained a job related to their field of study were far more likely to be satisfied.

Figure 20. Graduate satisfaction by educational requirement for job



Maximum likelihood logistic regressions were performed for each year from 2002 to 2007 (Appendix 5). The Wald Chi-Square tests with p-value 0 indicate that this model as a whole is statistically significant, as compared to models with no predictors. The model resulted in a pseudo R^2 of between 0.35 and 0.37, depending on the survey year (Table 19).[32] The regression results for the subset of employed graduates were similar to the results for all respondents. College size and region still had negligible impact on the satisfaction of employed graduates. However, gender and age ceased to be significant influencers of employed graduates' satisfaction for all survey years. Furthermore, when the questions specific to employed graduates were added to the models as regressors, field of study became far less significant in influencing employed graduate satisfaction, while credential almost ceased to be significant except that graduates with graduate certificates were significantly less satisfied in 2004 and 2005.

[32] The model with only administrative information and graduates' current status (same as the one for all graduates) was also run for employed graduates, resulting in pseudo R^2 between 0.22 and 0.27. Results are available from the authors.

Table 19. Models for employed graduates' satisfaction, 2002-2007

	2002	2003	2004	2005	2006	2007
Number of observations	11,576	12,698	13,367	14,267	15,183	14,675
Pseudo R^2	0.3645	0.3734	0.3707	0.3525	0.3553	0.3592

The regression analysis showed that gender, age, college size, and region had negligible impact on the satisfaction of employed graduates. As expected, working in a job related to their field of study, a higher hourly salary, and working at a job that required PSE as compared to high school only were all positive influencers on satisfaction. However, graduates working part-time were not significantly less satisfied than those working full-time. Graduate satisfaction with specifics of their college program, such as quality of instruction, equipment, course content, courses being up-to date, preparation for job market, skills developed in co-op, clinical, and field placement experience were all strongly positive influencers in all survey years examined. Satisfaction with skills related to critical thinking, and specific job preparation positively influenced overall satisfaction for most survey years.

Influences on Salary: Descriptive Analyses

The determination of annual salaries is often very complex, due to difficulties in standardizing hours worked per week and duration of work period. For the current survey data set, the early survey time period of only six months after graduation makes determination of an annual salary even more problematic, since many new employees would take time to reach full-time status. Therefore, hourly salary[33] was used in this paper, both for the descriptive and for the regression analyses.

Table 20 contains the mean hourly salary of employed graduates by year and by various characteristics. The mean salary increased from $14.58/hour in 2002 to $15.97/hour in 2007, averaging $15.14/hour over these years.[34] Generally speaking, older graduates appeared to be paid higher than younger graduates. Region of college and institutional size appeared to have little effect on hourly salary, whereas field of study and credential type had a large impact. Health graduates earned the most followed by graduates of engineering/technology. Those with a 1- year graduate certificate, whose graduates have a previous college or university credential, were paid the highest among all college credentials. The hourly salary

[33] The analysis on hourly salary in this paper excluded graduates who said they worked less than 2hr or more than 60 hr/ week, and earned less than $2/hr or more than $100/hr.
[34] It should be noted that diploma nursing, a 3- year program, was replaced by a collaborative college-university degree during the time period shown, resulting in a drop in earnings for 3- year diploma programs.

for graduates from 1-, 2-, or 3-year programs demonstrated a hierarchy related to program duration, with graduates of 3-year programs earning the most.

Table 20. Hourly salary of college graduates by various characteristics

	2002	2003	2004	2005	2006	2007	2002-2007
Number of observations	22,802	24,170	25,486	26,773	27,340	25,893	152,464
Average	14.58	14.76	15.06	15.06	15.28	15.97	15.14
Age							
Under 22	12.25	12.25	12.57	12.85	13.35	13.84	12.92
Between 22 and 25	14.24	14.33	14.56	14.82	14.98	15.61	14.77
Older than 25	16.29	16.75	17.31	17.12	17.28	17.95	17.12
Gender							
Female	14.50	14.81	15.21	14.83	15.08	15.75	15.04
Male	14.67	14.67	14.84	15.37	15.56	16.23	15.27
Funding							
Others	12.89	13.35	13.93	13.79	13.21	14.65	13.72
Ministry	14.63	14.80	15.10	15.10	15.34	16.02	15.18
College Size							
Small	13.99	14.40	15.18	14.77	14.92	15.98	14.87
Medium	14.48	14.72	15.05	15.23	15.28	16.07	15.15
Large	14.74	14.85	15.04	15.02	15.35	15.91	15.17
College Region							
Central	14.51	14.79	15.11	14.99	15.31	15.88	15.11
Eastern	14.81	14.85	14.77	14.91	15.17	15.88	15.07
Metro Toronto	14.91	14.95	15.13	15.31	15.47	16.06	15.33
Northern	14.16	14.52	15.38	15.15	15.11	16.35	15.12
Southwest	14.07	14.45	15.02	14.88	15.13	15.83	14.93
Field of Study							
Business	14.00	14.08	13.99	14.60	14.85	15.58	14.54
Community Service	13.57	13.59	13.68	14.24	14.27	15.13	14.12
Creative and Applied Arts	13.13	13.04	12.91	13.40	13.97	14.41	13.51
Health	18.16	18.67	19.48	18.44	19.07	19.71	18.92
Hospitality	10.82	11.27	11.63	11.69	12.01	12.54	11.69
Preparatory/Upgrading	10.91	10.65	11.14	11.74	11.51	12.35	11.47
Engineering/Technology	14.83	14.85	15.04	15.67	16.01	16.68	15.57
Credential Type							
1-year Certificate	13.17	13.58	12.86	13.31	13.43	13.97	13.38
2-year Diploma	13.47	13.59	14.01	14.49	14.86	15.54	14.39
3-year Advanced Diploma	15.99	16.40	16.94	16.10	16.09	16.68	16.37
1-year Graduate Certificate	18.22	17.70	18.00	18.33	18.44	18.93	18.30
4-year Degree	--	--	--	--	--	17.38	17.38

The effect of job relatedness to field of study and educational requirement for the job was also analysed for its potential impact on earnings (Table 21). As might be expected, graduates working in a job related to their field of study earned more than those working at non-related jobs. Additionally, graduates working in jobs requiring a degree earned the most, followed by those working in jobs requiring a completed college/trade education, with graduates working in jobs requiring only high school education or less earning the least. Interestingly, graduates working full-time appeared to be paid a lower hourly wage than graduates working part-time in all years studied.

The potential link between a graduates' satisfaction with various aspects of their education and earnings was also examined. Graduates who considered the skills that they gained in college as helpful in getting a job also appeared to earn more. Also, greater satisfaction with "course content", "preparation for the job market", "skills developed in co-op, clinical, field placement experience, and career placement services" was linked to better pay, while satisfaction with "course up-to-date" and "overall quality of instruction" was linked to better pay only in recent years. Surprisingly, there appeared to be a negative association between graduates' satisfaction with "equipment was up-to-date" and earnings for all years.

Table 21. College graduates' hourly salary by job related characteristics

	2002	2003	2004	2005	2006	2007	2002-2007
Full-/Part-time Work							
Part-time	14.78	15.20	15.24	15.48	15.67	16.20	15.44
Full-time	14.54	14.67	15.01	14.97	15.21	15.93	15.07
<30hr but Full-time	15.10	15.77	16.91	15.97	15.51	15.65	15.82
Job Related to field of study							
Related	15.76	16.21	16.62	16.36	16.55	17.17	16.46
Partially related	13.99	13.99	13.92	14.50	14.86	15.51	14.51
Not related	11.99	12.00	12.14	12.57	12.79	13.38	12.49
Education Required for Job							
High School	11.69	11.79	11.94	12.32	12.50	13.04	12.25
Partial PSE	15.03	15.62	15.75	15.61	16.01	16.28	15.71
Diploma/Certificate/Trade	16.23	16.60	17.07	16.79	17.05	17.59	16.90
Complete Degree	18.47	18.84	18.83	19.33	19.44	19.91	19.26
Other skills or Co-op placement	13.37	13.50	13.52	14.19	14.13	15.24	13.96
Skills gained in college were helpful in getting job							
Not helpful/Neither(1, 2, 3)	12.54	12.41	12.72	12.91	13.16	13.72	12.89
Helpful (4,5)	15.18	15.46	15.89	15.71	15.92	16.57	15.81
Graduates Satisfied with 'Course Content'							
Not Sat./Neither	14.34	14.62	14.86	14.67	14.79	15.19	14.74
Satisfied	14.65	14.81	15.13	15.14	15.37	16.07	15.22
Graduates Satisfied with 'Courses up-to-date'							
Not Sat./Neither	14.44	14.96	15.21	15.04	15.18	15.59	15.05
Satisfied	14.63	14.76	15.08	15.09	15.31	16.02	15.17
Graduates Satisfied with 'Instruction Quality'							
Not Sat./Neither	14.62	15.00	15.15	14.94	15.01	15.63	15.05
Satisfied	14.59	14.75	15.08	15.10	15.34	16.02	15.17
Graduates Satisfied with 'Equipment was up-to-date'							
Not Sat./Neither	15.10	15.60	15.98	15.54	15.85	16.31	15.71
Satisfied	14.48	14.59	14.90	14.99	15.19	15.89	15.04
Graduates Satisfied with 'preparation for the job market'							
Not Sat./Neither	13.64	13.82	13.91	13.99	14.28	14.83	14.07
Satisfied	14.91	15.09	15.44	15.37	15.58	16.26	15.47
Graduates Satisfied with skills developed in co-op, clinical, field placement experience, and career placement services							
Not Sat./Neither	13.60	13.80	13.95	13.96	14.29	15.01	14.12
Satisfied	15.04	15.25	15.63	15.49	15.73	16.29	15.59

As described previously, graduates were asked about the importance of, and their satisfaction with, various skills in their current job (Table 22). Not surprisingly, graduates who indicated that various skills/abilities were important in their job also earned more. Numeracy skill was one skill area where there

was little difference in skill importance and earnings. Interestingly, there did not appear to be a link between satisfaction with this skill and hourly earnings.[35]

Table 22. Rated importance of skills/abilities in current job and hourly salary

	2002	2003	2004	2005	2006	2007	2002-2007
Personal/Interpersonal skills							
Not imp./Neither	12.88	12.95	12.85	13.36	13.70	14.26	13.35
Important	14.94	15.11	15.45	15.38	15.58	16.29	15.48
Preparation for specific job							
Not imp./Neither	12.67	12.67	12.67	13.09	13.44	13.94	13.08
Important	15.01	15.20	15.52	15.45	15.64	16.35	15.55
Communication skills							
Not imp./Neither	12.92	12.78	12.86	13.36	13.72	14.25	13.34
Important	15.09	15.31	15.65	15.53	15.73	16.44	15.64
Critical Thinking/Problem Solving/Information Management							
Not imp./Neither	13.15	13.16	13.37	13.59	13.89	14.55	13.64
Important	15.53	15.80	16.14	16.01	16.20	16.88	16.11
Numeracy							
Not imp./Neither	14.40	14.45	14.58	14.95	15.15	15.85	14.92
Important	15.01	15.26	15.64	15.36	15.59	16.29	15.54

Influences on Hourly Salary: Regression Analyses

As was discussed in a previous section, descriptive data alone is limited when analyzing influences on various outcomes, with a high possibility of overlap between variables. For example, health graduates' relatively high salary may be related to the fact that they were far more likely to work at related jobs. Therefore, log linear regressions were performed for hourly salary each year from 2002 to 2007. All of the factors described above were included in the model.[36,37] The resulting models were significant, with an adjusted R^2 of between 0.27 and 0.39, depending on the survey year (Table 23, Appendix 6). Due to the major impact gender has on earnings, the regression models were run separately for males and

[35] The table is available on request from the authors.
[36] The dummy is 1 if the surveyed graduate was satisfied/very satisfied or if he/she felt that the skills were important/very important, 0 if otherwise. The dummy models also include interact terms between importance of the skills and satisfaction with educational preparation for the skills.
[37] Importance of the skills, satisfaction with education preparation for the skills, and satisfaction with specifics of college program were included in the log linear models in two ways: numerical and dummy. Numerical models included these variables directly using their scales from 1 to 5, while dummy models included the dummies of these variables instead. These two kinds of models yield similar results in the effects of most of above factors. Only dummy models are presented and interpreted in this paper. The results from numerical models are available on request.

females.[38] The model proved to be much better at explaining female than male earnings, particularly between 2002 and 2005.

Table 23. Regression model for hourly salary

	2002	2003	2004	2005	2006	2007
Number of obs	11631	12756	13405	14311	15224	14721
Adj R-squared	0.3361	0.3453	0.3906	0.2997	0.2822	0.2738
Adj R-squared (Male only)	0.2295	0.2416	0.2578	0.2146	0.2223	0.2132
Adj R-squared (Female only)	0.4084	0.4192	0.4700	0.3687	0.3366	0.3353

In the current analysis, even when controlling for field of study and hours worked, the gender gap remains significant for all years studied, with males earning more. Although the descriptive data did not show much of a difference, with females earning more in some years, most could be attributed to the high prevalence of women in the higher paying health fields. The earnings gap between males and females is commonly seen in the labour market, however it has often been attributed to either field of study, industry, occupation effects or a differential in hours worked. For example, a recent Statistics Canada report using Canadian census data has shown that the difference in earnings between males and females even with similar levels of education was explained by the entry of women into lower-paying occupations. Male and female entrants in the same occupations earned similar amounts (Statistics Canada, 2008). The impact of occupation and industry on earnings was not analyzed in the current paper. However, since the information is collected in the survey, future work can account for the effect of industry and occupation.

As seen in the descriptive analysis, graduates who were 22 years of age and older earned more than younger graduates. This may be as a result of older workers having more previous labour market experience and/or education, both of which are not asked in the survey. However, it can be assumed that the majority of graduates under 22 years of age would have gone to college very shortly after high school. Previous research using data from Statistics Canada's National Graduate Survey, has shown that Canadian college graduates with any previous postsecondary education (complete or incomplete) earn more than those who go directly to college, while those who delayed entry to college experience no impact on earnings relative to those who went directly (Dubois, 2007).

[38] The results are available on request.

The impact of college size and location had an inconsistent influence on graduates' salary, such that graduating from a smaller college or a college in the southwestern region only had a negative impact on earnings in 2005 and 2006.

Relative to business fields, graduating from a health or engineering/technology field had a consistent and significantly positive impact on salary, while graduating from hospitality or creative and applied arts had a negative impact on earnings. Further tests indicated that health graduates were paid the highest, while graduates of hospitality were paid the least for all years, even controlling for all other factors. Relative to a 2-year diploma, obtaining a 1-year graduate certificate or a 3-year advanced diploma consistently and significantly had a positive influence on graduates' hourly salary, while obtaining a 1-year certificate had a significantly negative influence. Overall, those attaining a 1-year graduate certificate had the highest hourly pay of all credentials.

As would be expected, graduates working in a job related to their field of study earned a higher hourly salary. Relative to working in a job requiring a college/ trade credential, working in a job that required only partial PSE or less had a negative impact on salary, while working in a job requiring a degree had a positive impact. However, it is surprising that controlling for all other factors, working full-time still had a consistent and significantly negative impact on hourly salary, relative to working part-time. One explanation may be that entry level in some of the better paying occupations may involve casual or part-time work, until the graduate obtains more experience, or gains seniority. There is also an interesting gender effect when the models were run separately in that working full-time has no significant effect for males but has a significantly negative effect for females.

As seen in the descriptive data, graduates who were satisfied that "equipment was up-to-date" in their program earned less than those who were less satisfied, for the years 2003 to 2006. A possible reason for this unexpected result may be a contrast between equipment that a graduate is exposed to in their job and what they were exposed to in their program. It could be that the more higher paying a job is, the more sophisticated the equipment is.

The regression analysis also showed that graduates who were satisfied that their college program prepared them for the job market were also more likely to earn more. It is unclear from this result whether graduates who are earning more look back on their college preparation more favourably, or whether their higher earnings are a genuine reflection of the college's preparation of their students.
Graduates who considered the skill cluster that included critical thinking, problem solving, and information management important in their current job consistently earned more for all years analyzed. Additionally,

in three of the six years studied, working in a job in which communication skills were considered important was also significantly positively related to earnings. This would seem to demonstrate that the labour market is rewarding these skills. Further analysis will be able to test whether this result is linked to specific occupations or industries. In contrast, there was no evidence that graduates' satisfaction with educational preparation for the listed skills had a significant impact on hourly salary, a result that was also seen in the descriptive data. This implies that the graduates' satisfaction with learning quality was not coloured by their ultimate earnings, and that they viewed them independently. Table 24 contains a summary of the regression results for influencers on earnings and overall satisfaction.

Table 24. Summary of influences on earnings and satisfaction for employed graduates

Significant influencers on hourly salary	Significant influencers on graduate satisfaction
• Male • Older • Graduating from health or technology • Attaining more advanced credentials • Working part-time • Working in a related field • Working in a job requiring a PSE credential • Working in a job that requires critical thinking/problem solving/information management skills • High satisfaction with preparation for job market	• Making more money • Working in a related field • Working in a job requiring at least some postsecondary education • High satisfaction with course content, quality of instruction, equipment, preparation for job market, skills developed in co-op, clinical, field placement experience, etc. • High satisfaction with skills related to specific job preparation • Those who considered that the skills gained in college are helpful in getting a job

Conclusion

The graduate survey was introduced to give the province and public an idea of how the college sector is performing overall, and to inform future students on career choices. It has also been used more and more frequently by colleges for program review, so that colleges can work at the level where they can impact change. Whether or not the desire to improve this measure has had an effect, it is worthy to note that, as a system, graduate satisfaction has increased significantly during the years studied (2002 to 2007), from 79.7% to 82.5%.

The purpose of this study was to determine, using available variables in the graduate survey, as well as some college characteristics, the influencers on graduate satisfaction, earnings, and employment. The first phase of the analysis examined the factors influencing satisfaction of all graduates. Specifically, the regression results showed that:

- There was no significant difference in satisfaction between regions, despite descriptive results showing that college graduates from metro Toronto were less satisfied than other graduates.
- Health graduates were the most satisfied among all fields of study.
- One-year certificate holders were more satisfied than other credentials.
- Graduates working at related job were the most satisfied, followed by those studying and not working. Graduates working at unrelated jobs were the least satisfied.

However, the resulting model for all graduates has a low pseudo R^2 (around 0.1) indicating that it was limited in explaining all the variance in college graduates' satisfaction. Therefore, the regression models were also run within the group of employed graduates. When the additional questions asked of employed graduates were included in the analysis, the model became much stronger.

The results from the regression analyses for employed graduates only, showed, as expected, that those who earn more, obtain a job related to their field of study, and a job which matches their qualification are also the most satisfied. Whether these high quality jobs are contingent on the economy or the college, or the type of student attracted to a specific college is unclear. In terms of influencers on earnings, graduates in a job related to their field of study or in a job that requires more education, also earned more. Graduates working at a job that did not require any postsecondary education were paid the least, and were the least satisfied. Additionally those working at a job that required a university degree were paid the highest, but they were not more satisfied than graduates working at a job requiring a certificate/diploma/trade credential. Unexpectedly, graduates working full-time were paid a lower hourly salary than graduates working part-time. Nevertheless, they were not less satisfied than graduates working part-time.

In addition to labour market outcomes, employed graduates' satisfaction with specifics of the programs such as course content, whether courses were up-to-date, quality of instruction, whether equipment was up-to-date, preparation for the job market and skills developed in co-op, clinical, field placement experience, and career placement services had a significantly strong positive effect on graduates' overall satisfaction. However, in terms of salary, satisfaction with preparation for the job market was the only course-related aspect that had a consistently positive effect over the years studied.

Employed graduates' satisfaction with skills related to specific job preparation and critical thinking had a positive influence on their overall satisfaction. For graduate earnings, graduates who indicated that critical thinking/problem solving/information management skills were important in their job also earned more.

Employment/Income Results

During the years analysed, the employment rate of college graduates has increased, mirroring the increased employment rate of the population, with 90% of college graduates in the labour market finding jobs within six months after graduation.

- It was harder for graduates who were older or who were male to find a job than younger or female graduates. However, their salaries were higher than younger or female graduates when they found a job.
- Graduates from central, eastern or southwestern colleges were more likely to find a job than metro Toronto college graduates, however their salaries were similar.
- Health graduates were the most likely to find a job and were the highest paid. Hospitality graduates and community service graduates were more likely to find a job than business graduates, but hospitality graduates earned significantly lower salaries. Engineering graduates' employment situation was not consistently better than graduates of business, but their salaries were significantly higher.
- Among all college credentials, certificate holders were the least likely to find a job, and also earned the least. Interestingly, they were not significantly less satisfied than those with other credentials. Graduate certificate holders were paid the highest, followed by 3-year diploma graduates. However, graduate certificate holders' employment rates were higher in recent years (2006, 2007), while advanced diploma holders' employment were better in past years (2002, 2003, 2005). Graduates with college degrees (in 2007) earned more than diploma holders, but were not significantly more likely to be employed.

Policy Implications

Currently the Ontario government uses the results from this survey to develop two key performance indicators: employment rate and graduate satisfaction rate. The major policy question is whether a college can do anything to alter graduate satisfaction or employment rate? Is graduate satisfaction useful as a KPI? The current study was limited in determining influencers of employment rate, due to the limited information in the survey on graduates not working. Therefore, the question on whether a college can influence employment rate cannot be answered here. However, the analysis does demonstrate that type of credential and the field of study does impact employment rate controlling for available variables. Although for performance funding purposes, MTCU does factor in regional employment rates; it does not take into consideration credential mix and field of study mix of the institution, both of which contribute

significantly to the employment rate.

The results show, as would be expected, that employed graduates' overall satisfaction is influenced strongly by the quality of the job the graduate has obtained (i.e. higher salary, job related to program, job requires PSE). However, it is also independently influenced by graduate satisfaction with various aspects of educational quality, such as quality of instruction, course content and whether or not the graduate considered the skills gained in college to be "helpful" in obtaining a job. Additionally, graduates who were more satisfied with skills and abilities specific to their job, such as job-related knowledge and skills were also more satisfied overall. Therefore, an institution can improve its graduate satisfaction either by improving teaching and learning quality and students' skill development and/ or by helping its graduates to obtain high quality jobs. In terms of job quality, although local labour market conditions may be out of an institution's control, colleges may be able to improve by continuing to align with local labour markets, and by providing students and graduates with job searching strategies and career counseling to help them to obtain high quality jobs. Furthermore, for the employed graduates, field of study, region or credential did not significantly impact overall satisfaction when job quality and educational quality are controlled for. Therefore, overall graduate satisfaction could be a fairly reasonable proxy for the overall educational quality of a college, demonstrating its usefulness as a KPI. However, an institution should strive for improvement of the indicator, particularly within programs, rather than using it as a comparison tool with other colleges.

Next Steps

The graduates are also asked in the survey for details on the industry and occupation in which they participate; this part of the analysis has not yet been conducted. It will be especially interesting in relation to the current changes in the economy in the past year, with the KPI employment rate dropping from 89% for 2007-08 graduates to 85% for the 2008-09 graduates (MTCU, 2010).

In relation to potential enhancements to survey design, it would be helpful to obtain information about graduates' previous education and labour market experiences in order to account for the influence of these factors (in addition to the current college credential) on graduate outcomes. As well, the satisfaction with the educational experiences of those not employed (i.e., in further education, not in labour force) would also be useful, since the current survey asks only working graduates questions relating to this area.

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Appendices

Appendix 1. College region and size categories

Code	College Name	College Region[39]	College Size[40]
ALGO	Algonquin College	Eastern	Large
BORE	Collège Boréal	Northern	Small
CAMB	Cambrian College	Northern	Medium
CANA	Canadore College	Northern	Small
CENT	Centennial College	Metro Toronto	Large
CONF	Confederation College	Northern	Small
CONS	Conestoga College	Southwestern	Medium
DURH	Durham College	Central	Medium
FANS	Fanshawe College	Southwestern	Large
GRBR	George Brown College	Metro Toronto	Large
GEOR	Georgian College	Central	Medium
HUMB	Humber College	Metro Toronto	Large
LACI	La Cité collégiale	Eastern	Medium
LAMB	Lambton College	Southwestern	Small
LOYT	Loyalist College	Eastern	Small
MOHA	Mohawk College	Central	Large
NIAG	Niagara College	Central	Medium
NORT	Northern College	Northern	Small
SAUL	Sault College	Northern	Small
SENE	Seneca College	Metro Toronto	Large
SHER	Sheridan College	Central	Large
SLAW	St. Lawrence College	Eastern	Medium
SSFL	Sir Sandford Fleming College	Eastern	Medium
STCL	St. Clair College	Southwestern	Medium

[39] College Region is classified according to the postal code of the college's main campus. (Eastern: K; Central: L; Metro: M; North: P; South: N).
[40] College Size is classified according to MTCU audited Full-time equivalent (FTE) enrolment for 2006-07. (Small = <3200 FTE; Medium = between 3200- 9000 FTE; Large = >9000 FTE).

Appendix 2. Grouping of Field of Study by MTCU Occupation Cluster

Code	Field of Study	Occupational Cluster Name	Nom du groupe de programmes
A16	Business	Public Relations	Relation publiques
B00	Business	BUSINESS - UNKNOWN CATAGORY	Commerce - Inconnu
B01	Business	Business Computer	Informatique de gestion
B02	Business	Office Administration - Health	Administration de bureau - médical
B03	Business	Office Administration - Legal	Administration de bureau - juridique
B04	Business	Office Administration	Administration de bureau
B06	Business	Business Management	Commerce - gestion
B07	Business	Accounting/Finance	Comptabilité financière
B10	Business	Government/Real Estate	Immobilier
B11	Business	Human Resources/Industrial Relations	Ressources humaines/relations industrielles
B12	Business	Marketing/Retail Sales	Marketing et commerce de détail
B13	Business	Materials Management	Gestion de stocks
B14	Business	Small Business	Petites entreprises
B15	Business	Business Legal	Droit commercial
B18	Business	Aviation Management	Aviation - gestion
B19	Business	Arts Administration	Administration des arts
A10	Community Service	Law and Security	Loi et sécurité
A11	Community Service	Library	Bibliothéconomie
A12	Community Service	Education	Enseignement
A13	Community Service	Child/Youth Worker	Travail auprès des enfants et des jeunes
A14	Community Service	Developmental Services Worker	Réadaptation
A15	Community Service	Recreation/Fitness	Conditionnement physique et loisirs
A17	Community Service	Social Services	Services sociaux
A18	Community Service	Community Planning	Techniques d'urbanisme
A19	Community Service	Native Community Worker	Travail communautaire auprès des autochtones
B09	Community Service	Recreation Facilities	Loisirs
A00	Creative and Applied Arts	ARTS - UNKNOWN CATAGORY	Arts Appliqués - Inconnu
A01	Creative and Applied Arts	Media	Médias
A02	Creative and Applied Arts	Performing Arts	Arts dramatiques
A03	Creative and Applied Arts	Fashion	Techniques et création de mode
A04	Creative and Applied Arts	Advertising and Design	Publicité et design
A05	Creative and Applied Arts	Art	Beaux-arts
A06	Creative and Applied Arts	Crafts	Artisanat
A07	Creative and Applied Arts	Graphic Arts/Printing	Création et production graphique
A08	Creative and Applied Arts	Horticulture	Horticulture
T00	Engineering/Technology	TECHNOLOGY - UNKNOWN CATAGORY	Technologie - Inconnu
T01	Engineering/Technology	Architectural	Architecture
T02	Engineering/Technology	Automotive	Véhicules moteurs
T03	Engineering/Technology	Chemical/Biological	Chimie et biologie
T04	Engineering/Technology	Civil	Génie civil
T05	Engineering/Technology	Drafting	Dessin industriel
T06	Engineering/Technology	Electronics	Électronique
T07	Engineering/Technology	Industrial	Génie industriel
T08	Engineering/Technology	Instrumentation	Instruments de précision
T09	Engineering/Technology	Mechanical	Mécanique
T10	Engineering/Technology	Power	Production d'énergie
T11	Engineering/Technology	Resources	Richesses naturelles
T12	Engineering/Technology	Furniture/Wood Products	Ameublement et produits du bois
T13	Engineering/Technology	Welding	Soudage
T14	Engineering/Technology	Aviation (Maintenance)	Aviation (entretien des appareils)
T15	Engineering/Technology	Aviation (Flight)	Aviation (vols)

Code	Field of Study	Occupational Cluster Name	Nom du groupe de programmes
T16	Engineering/Technology	Machining	Usinage
T17	Engineering/Technology	Marine	Technologie maritime
T18	Engineering/Technology	Geology/Mining	Géologie et mines
T19	Engineering/Technology	Technology Miscellaneous	Technologie - divers
H00	Health	HEALTH - UNKNOWN CATAGORY	Santé - Inconnu
H01	Health	Health - Miscellaneous	Santé/divers
H02	Health	Animal Care	Soins des animaux
H03	Health	Health Technology	Technologie de la santé
H04	Health	Nursing Related	Soins infirmiers et programmes connexes
B05	Hospitality	Culinary Arts	Arts culinaires
B16	Hospitality	Travel/Tourism	Voyage/tourisme
B17	Hospitality	Hospitality Management	Industrie de l'accueil - gestion
A09	Preparatory/Upgrading	Preparatory/Upgrading	Recyclage et cours préparatoires

Appendix 3. Regression Analysis graduate satisfaction: All survey respondents

		2002		2003		2004		2005		2006		2007	
Number of obs		34,438		36,701		40,138		42,032		42,400		40,017	
LR chi2		4201.4		4841.42		4615.13		4458.44		4170.06		3598.23	
Prob > chi2		0		0		0		0		0		0	
Log likelihood		-15273.169		-16140.795		-17528.911		-17816.365		-17924.783		-16675.437	
Pseudo R2		0.1209		0.1304		0.1163		0.1112		0.1042		0.0974	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
AGE (Reference: younger than 22)	between 22 and 25 yrs old	-0.080*	0.040	-0.082*	0.039	-0.023	0.036	-0.031	0.035	-0.171**	0.034	-0.134**	0.036
	older than 25	-0.144**	0.043	-0.139**	0.042	-0.091*	0.040	-0.072	0.039	-0.154**	0.038	-0.099*	0.04
GENDER	male	-0.107**	0.032	-0.072*	0.031	-0.091**	0.030	-0.020	0.030	-0.025	0.030	-0.044	0.031
FUNDING	ministry funded	0.037	0.080	0.002	0.080	-0.116	0.075	-0.126	0.085	-0.170*	0.086	-0.097	0.078
COLLEGE SIZE (Reference: Medium)	small	-0.108	0.067	0.091	0.063	-0.103	0.058	-0.114	0.059	-0.019	0.062	-0.103	0.064
	large	-0.135**	0.039	-0.067	0.038	-0.051	0.036	0.008	0.036	0.009	0.036	-0.070	0.038
REGION (Reference: Metro Toronto)	central	-0.051	0.042	-0.012	0.041	-0.104**	0.040	-0.067	0.040	-0.084*	0.040	-0.043	0.041
	eastern	-0.094*	0.048	0.105*	0.047	-0.066	0.045	-0.028	0.045	0.009	0.045	0.004	0.047
	northern	0.074	0.078	-0.102	0.073	0.086	0.071	0.115	0.070	0.051	0.073	0.108	0.075
	southwestern	-0.042	0.051	-0.062	0.048	-0.150**	0.046	-0.061	0.047	0.015	0.046	-0.034	0.047
FIELD OF STUDY (Reference: Business)	Community service	0.440**	0.047	0.523**	0.047	0.470**	0.044	0.369**	0.043	0.361**	0.043	0.246**	0.045
	Creative and Applied Arts	-0.075	0.047	-0.097*	0.045	0.019	0.046	-0.111*	0.044	-0.179**	0.044	-0.104*	0.047
	Health	0.811**	0.064	0.645**	0.061	0.584**	0.054	0.657**	0.058	0.492**	0.059	0.294**	0.059
	Hospitality	-0.096	0.071	0.122	0.073	-0.127*	0.067	-0.188**	0.068	-0.125	0.067	-0.255**	0.067
	Preparatory/Upgrading	0.309**	0.080	0.230**	0.076	0.283**	0.070	0.319**	0.069	0.221**	0.065	0.124	0.067
	Engineering/Technology	-0.085*	0.042	-0.173**	0.042	-0.103*	0.041	-0.065	0.042	-0.102*	0.042	-0.200**	0.044
CREDENTIAL TYPE (Reference: 2 Year Diploma)	1 year Certificate	0.061	0.050	0.255**	0.049	0.265**	0.046	0.193**	0.045	0.164**	0.044	0.236**	0.045
	3 year Advanced Diploma	-0.033	0.037	0.023	0.036	0.031	0.035	-0.066	0.035	0.053	0.035	0.099**	0.038
	1 year Graduate Certificate	-0.171**	0.056	-0.103	0.055	-0.200**	0.053	-0.206**	0.053	-0.073	0.053	-0.079	0.054
	4 year Degree											-0.384**	0.144
CURRENT STATUS (Reference: Studying not Working)	Job Related	0.625**	0.047	0.606**	0.047	0.577**	0.045	0.485**	0.044	0.588**	0.043	0.495**	0.045
	Job Partially Related	-0.438**	0.061	-0.442**	0.060	-0.579**	0.057	-0.594**	0.056	-0.520**	0.056	-0.571**	0.057
	Job Not Related	-1.229**	0.044	-1.329**	0.043	-1.305**	0.040	-1.389**	0.040	-1.305**	0.039	-1.351**	0.041
	NOT Studying NOT Working	-1.083**	0.050	-1.166**	0.050	-1.127**	0.048	-1.238**	0.048	-1.060**	0.049	-1.128**	0.051
	constant	1.716**	0.106	1.684**	0.105	1.856**	0.097	1.964**	0.101	2.014**	0.102	2.095**	0.099

Significance: *=5%, **=1%

Appendix 4. Regressions for employment rate

		2002		2003		2004		2005		2006		2007	
Number of obs		28,760		30,486		32,361		33,129		33,368		31,814	
LR chi2		1078.7		986.33		891.1		595.07		475.46		471.34	
Prob > chi2		0		0		0		0		0		0	
Log likelihood		-9900.9166		-10322.363		-10816.642		-10177.132		-9633.2566		-8908.4985	
Pseudo R2		0.0517		0.0456		0.0396		0.0284		0.0241		0.0258	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
AGE (Reference: younger than 22)	between 22 and 25 yrs old	-0.109	0.059	-0.109	0.057	-0.169**	0.056	-0.177**	0.056	-0.196**	0.057	-0.23**	0.061
	older than 25	-0.622**	0.059	-0.636**	0.057	-0.729**	0.056	-0.737**	0.056	-0.69**	0.057	-0.691**	0.061
GENDER	male	-0.173**	0.041	-0.127**	0.041	-0.113**	0.041	-0.152**	0.043	-0.129**	0.044	-0.199**	0.046
FUNDING	ministry funded	0.395**	0.096	0.359**	0.094	0.089	0.088	0.117	0.1	0.098	0.103	0.084	0.095
COLLEGE SIZE (Reference: Medium)	small	0.071	0.093	-0.033	0.087	-0.091	0.086	-0.018	0.09	0.073	0.099	0.091	0.102
	large	0.072	0.054	-0.048	0.052	-0.092	0.052	-0.123*	0.054	-0.03	0.056	0.038	0.058
REGION (Reference: Metro Toronto)	central	0.49**	0.056	0.334**	0.054	0.383**	0.054	0.286**	0.057	0.312**	0.058	0.344**	0.062
	eastern	0.361**	0.062	0.3**	0.061	0.197**	0.059	0.26**	0.062	0.274**	0.065	0.315**	0.07
	northern	0.011	0.104	-0.054	0.099	0.068	0.099	-0.125	0.102	-0.05	0.111	0.063	0.115
	southwestern	0.712**	0.071	0.48**	0.067	0.491**	0.067	0.441**	0.07	0.375**	0.07	0.304**	0.071
FIELD OF STUDY (Reference: Business)	Community service	0.664**	0.061	0.591**	0.061	0.535**	0.059	0.403**	0.061	0.452**	0.062	0.46**	0.066
	Creative and Applied Arts	0.02	0.061	0.064	0.06	0.134*	0.062	0.034	0.063	0.006	0.065	-0.009	0.067
	Health	1.484**	0.081	1.42**	0.077	1.115**	0.064	0.706**	0.07	0.827**	0.078	0.862**	0.083
	Hospitality	0.556**	0.099	0.395**	0.097	0.538**	0.099	0.319**	0.103	0.31**	0.102	0.298**	0.104
	Preparatory/Upgrading	-0.157	0.13	-0.142	0.127	0.312*	0.136	-0.294*	0.116	-0.037	0.124	-0.353**	0.115
	Engineering/Technology	0.107*	0.053	0.01	0.053	0.087	0.054	0.136*	0.058	0.111	0.059	0.188**	0.062
CREDENTIAL TYPE (Reference: 2 Year Diploma)	1 year Certificate	-0.211**	0.067	-0.163*	0.066	-0.338**	0.061	-0.163**	0.063	-0.158*	0.066	-0.16*	0.069
	3 year Advanced Diploma	0.137**	0.047	0.109*	0.046	0.001	0.046	0.097*	0.049	0.119*	0.05	0.092	0.054
	1 year Graduate Certificate	0.034	0.067	-0.014	0.066	0.024	0.065	0.068	0.068	0.204**	0.072	0.231**	0.073
	4 year Degree											0.182	0.214
	constant	1.325**	0.13	1.579**	0.127	1.984**	0.119	2.245**	0.127	2.238**	0.131	2.301**	0.129

Appendix 5. Regression analysis graduate satisfaction: Employed graduates

		2002		2003		2004		2005		2006		2007	
Number of obs		11,576		12,698		13,367		14,267		15,183		14,675	
LR chi2		3537.19		4044.91		4103.35		4116.75		4370.15		4216.97	
Prob > chi2		0		0		0		0		0		0	
Log likelihood		-3083.9079		-3393.946		-3482.8136		-3781.7378		-3964.1761		-3762.2074	
Pseudo R2		0.3645		0.3734		0.3707		0.3525		0.3553		0.3592	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
AGE	between 22 and 25 yrs old	-0.141	0.094	0.074	0.089	0.07	0.085	-0.095	0.079	0.001	0.075	-0.165*	0.079
(Reference: younger than 22)	older than 25	-0.135	0.105	0.049	0.101	0.009	0.097	-0.051	0.093	-0.069	0.088	-0.149	0.091
GENDER	male	-0.019	0.078	-0.014	0.075	0.07	0.075	0.123	0.07	0.005	0.068	0.073	0.07
FUNDING	ministry funded	0.092	0.202	0.261	0.197	0.221	0.18	0.063	0.189	-0.247	0.213	-0.07	0.168
COLLEGE SIZE	small	-0.385*	0.155	0.229	0.14	-0.149	0.136	-0.217	0.136	-0.003	0.142	-0.116	0.145
(Reference: Medium)	large	0.097	0.087	0.102	0.084	0.118	0.082	0.002	0.079	0.063	0.077	-0.089	0.081
COLLEGE	central	0.038	0.099	0.077	0.094	-0.073	0.095	-0.068	0.09	-0.109	0.087	-0.011	0.091
	eastern	0.141	0.114	0.161	0.11	-0.046	0.109	0.039	0.102	-0.018	0.099	0.038	0.104
(Reference: Metro Toronto)	northern	0.535**	0.19	-0.275	0.167	0.188	0.171	0.108	0.164	0.041	0.168	-0.048	0.171
	southwestern	0.088	0.117	0.078	0.111	-0.006	0.109	0.09	0.108	0.054	0.101	-0.025	0.102
FIELD OF STUDY	Community service	0.028	0.115	0.114	0.11	0.233*	0.111	0.155	0.1	0.039	0.096	-0.039	0.101
	Creative and Applied Arts	-0.109	0.116	0.109	0.112	0.164	0.115	0.047	0.105	-0.007	0.104	0.036	0.108
	Health	0.423**	0.139	0.233	0.126	0.138	0.116	0.395**	0.123	0.078	0.121	-0.052	0.121
(Reference: Business)	Hospitality	-0.419**	0.15	0.163	0.159	-0.055	0.15	-0.254	0.141	-0.157	0.144	-0.178	0.144
	Preparatory/Upgrading	0.539	0.308	0.683*	0.281	0.622*	0.266	0.681**	0.261	0.505*	0.219	0.308	0.236
	Engineering/Technology	-0.1	0.101	-0.115	0.097	-0.018	0.099	0.114	0.094	0.057	0.093	-0.226*	0.096
CREDENTIAL TYPE	1 year Certificate	-0.144	0.128	0.123	0.12	-0.084	0.116	0.005	0.109	0.149	0.112	0.204	0.11
(Reference: 2 Year Diploma)	3 year Advanced Diploma	-0.037	0.086	-0.105	0.081	-0.122	0.081	-0.119	0.077	-0.141	0.076	0.039	0.08
	1 year Graduate Certificate	-0.073	0.135	-0.108	0.134	-0.387**	0.13	-0.343**	0.127	-0.143	0.124	-0.214	0.121

		2002		2003		2004		2005		2006		2007	
	4 year Degree											-0.34	0.275
CURRENT STATUS	Job Related	0.825**	0.098	1.074**	0.094	1.006**	0.092	0.9**	0.089	1.169**	0.084	1.07**	0.088
(Reference: Work Not Related)	Job Partially Related	0.174	0.116	0.391**	0.111	0.216*	0.108	0.4**	0.104	0.436**	0.103	0.279**	0.1
JOB REQUIREMENT	high school education or less	-0.404**	0.097	-0.361**	0.093	-0.366**	0.091	-0.436**	0.087	-0.227**	0.084	-0.219*	0.087
(Reference: Diploma/ Certificate/ Trade)	partial PSE	-0.105	0.121	-0.076	0.121	-0.198	0.113	-0.236*	0.116	-0.036	0.11	-0.15	0.121
	Complete Degree	-0.251	0.196	-0.015	0.208	-0.124	0.201	0.19	0.183	0.077	0.183	0.108	0.157
	Others	-0.345*	0.142	-0.262*	0.141	-0.222	0.153	-0.349*	0.143	-0.203	0.15	-0.169	0.151
COLLEGE SKILLS HELPFUL GETTING JOB (1: helpful/extremely helpful; 0: neither/not helpful/not at all helpful)		0.787**	0.084	0.782**	0.079	0.909**	0.078	0.782**	0.078	0.855**	0.073	0.978**	0.077
EDUCATION SATISFACTION	courses contents	0.531**	0.087	0.703**	0.086	0.658**	0.086	0.648**	0.085	0.626**	0.083	0.56**	0.088
(1: satisfied/very satisfied; 0: neither/dissatisfied/very dissatisfied)	courses up-to-date	0.614**	0.09	0.387**	0.091	0.32**	0.093	0.573**	0.09	0.49**	0.09	0.251**	0.096
	overall quality of instruction	0.515**	0.087	0.576**	0.087	0.543**	0.087	0.231**	0.087	0.566**	0.083	0.637**	0.084
	equipment up-to-date	0.36**	0.081	0.084	0.081	0.255**	0.081	0.205*	0.081	0.365**	0.077	0.163*	0.082
	preparation for the job market	0.914**	0.072	1.039**	0.069	0.893**	0.069	0.964**	0.067	0.99**	0.065	1.112**	0.068
	skills developed in Co-op etc.	0.544**	0.076	0.561**	0.073	0.561**	0.071	0.664**	0.069	0.587**	0.067	0.447**	0.069
SATISFACTION OF SKILL PREPARATION	Personal/Interpersonal skills	0.505**	0.194	-0.057	0.186	-0.054	0.191	-0.132	0.173	0.256	0.169	0.028	0.172
	Preparation for specific job	0.412*	0.166	0.643**	0.166	0.516**	0.163	0.347*	0.157	0.251	0.148	0.384*	0.162
(1: satisfied/very satisfied; 0: neither/dissatisfied/very dissatisfied)	Communication skills	-0.006	0.154	-0.148	0.157	0.168	0.156	0.253	0.146	-0.138	0.14	0.173	0.146
	Critical Thinking / Problem Solving/ Information Management	0.213	0.113	0.114	0.11	0.344**	0.109	0.414**	0.103	0.101	0.1	0.248*	0.103
	Numeracy	0.153	0.105	-0.103	0.103	-0.037	0.102	0.055	0.096	0.168	0.095	0.117	0.094
IMPORTANCE OF SKILLS AT WORK	Personal/Interpersonal skills	0.172	0.155	0.069	0.154	0.072	0.162	-0.042	0.148	-0.038	0.141	0.025	0.145

		2002		2003		2004		2005		2006		2007	
(1: important/extremely important; 0: neither/not important/not at all important)	Preparation for specific job	0.116	0.126	-0.137	0.127	0.058	0.127	-0.077	0.126	0.091	0.12	-0.005	0.129
	Communication skills	-0.213	0.14	-0.207	0.146	0.027	0.147	0.025	0.139	0.042	0.136	0.1	0.146
	Critical Thinking / Problem Solving/ Information Management	0.163	0.107	-0.01	0.108	0.062	0.104	0.112	0.1	0.035	0.101	-0.011	0.103
	Numeracy	0.033	0.112	-0.344**	0.111	0.003	0.111	-0.177	0.104	0.045	0.101	0.038	0.106
INTERACT TERMS OF SATISFACTION AND IMPORTANCE OF SKILLS	Personal/Interpersonal skills	-0.133	0.206	0.314	0.198	0.266	0.201	0.45*	0.184	0.076	0.179	0.371*	0.184
	Preparation for specific job	0.232	0.18	0.175	0.178	0.296	0.176	0.351*	0.17	0.49**	0.159	0.29	0.173
	Communication skills	0.234	0.173	0.411*	0.174	-0.007	0.174	-0.001	0.163	0.221	0.159	-0.105	0.17
	Critical Thinking / Problem Solving/ Information Management	0.108	0.141	0.227	0.136	0.168	0.134	0.034	0.129	0.168	0.125	0.312*	0.129
	Numeracy	0.101	0.145	0.587**	0.139	0.222	0.139	0.28*	0.131	0.052	0.129	0.09	0.132
	ln (hour wage)	0.435**	0.104	0.508**	0.096	0.506**	0.1	0.365**	0.091	0.296**	0.088	0.681**	0.092
FT/PT JOB	working full-time	0.095	0.097	0.086	0.089	0.09	0.089	0.219*	0.086	0.059	0.085	0.022	0.089
	constant	-4.422**	0.421	-4.568**	0.406	-4.933**	0.399	-4.179**	0.375	-4.016**	0.378	-4.826**	0.369

Appendix 6. Regression Analysis for hourly salary*

		2002		2003		2004		2005		2006		2007	
Number of obs		11631		12756		13405		14311		15224		14721	
F		123.64		143.67		179.97		128.6		125.71		114.25	
Prob > F		0		0		0		0		0		0	
R-squared		0.3388		0.3518		0.3928		0.3021		0.2845		0.2762	
Adj R-squared		0.3361		0.3453		0.3906		0.2997		0.2822		0.2738	
Root MSE		0.30676		0.31403		0.30424		0.31992		0.32409		0.32274	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
AGE	between 22 and 25 yrs old	0.055**	0.008	0.057**	0.008	0.049**	0.007	0.061**	0.007	0.045**	0.007	0.06**	0.007
(Reference: younger than 22)	older than 25	0.123**	0.009	0.127**	0.009	0.121**	0.008	0.134**	0.008	0.116**	0.008	0.127**	0.008
GENDER	male	0.095**	0.007	0.088**	0.007	0.082**	0.006	0.104**	0.006	0.083**	0.006	0.082**	0.006
FUNDING	ministry funded	0.093**	0.018	0.106**	0.018	0.092**	0.015	0.156**	0.016	0.24**	0.017	0.181**	0.015
COLLEGE SIZE	small	-0.023	0.013	0.008	0.012	-0.016	0.011	-0.032**	0.012	-0.033**	0.012	-0.017	0.012
(Reference: Medium)	large	0.008	0.007	0.028**	0.007	0.008	0.007	-0.014*	0.007	0.003	0.007	0.009	0.007
COLLEGE	central	-0.017*	0.009	0.006	0.008	0.013	0.008	-0.008	0.008	-0.012	0.008	0.005	0.008
	eastern	-0.009	0.01	0.011	0.01	0	0.009	-0.012	0.009	-0.009	0.009	0.01	0.009
(Reference: Metro Toronto)	northern	-0.024	0.016	-0.023	0.015	0.001	0.014	0.001	0.014	-0.015	0.015	0.051**	0.014
	southwestern	-0.021*	0.01	-0.006	0.01	0	0.009	-0.03**	0.009	-0.025**	0.009	0.006	0.009
FIELD OF STUDY	Community service	-0.018	0.01	-0.01	0.01	-0.009	0.009	-0.009	0.009	-0.015	0.009	-0.017	0.009
	Creative and Applied Arts	-0.105**	0.011	-0.077**	0.011	-0.102**	0.011	-0.1**	0.01	-0.077**	0.01	-0.076**	0.01
	Health	0.255**	0.01	0.273**	0.01	0.3**	0.009	0.245**	0.009	0.255**	0.009	0.233**	0.009
(Reference: Business)	Hospitality	-0.153**	0.014	-0.13**	0.014	-0.121**	0.014	-0.135**	0.014	-0.129**	0.013	-0.125**	0.014
	Preparatory/Upgrading	-0.022	0.031	-0.038	0.029	0.019	0.027	0.043	0.027	0.083**	0.024	0.053*	0.026
	Engineering/Technology	0.028**	0.01	0.04**	0.01	0.058**	0.009	0.064**	0.009	0.073**	0.009	0.073**	0.009
CREDENTIAL TYPE	1 year Certificate	-0.175**	0.01	-0.17**	0.01	-0.204**	0.009	-0.168**	0.009	-0.152**	0.01	-0.139**	0.01
(Reference: 2 Year Diploma)	3 year Advanced Diploma	0.081**	0.007	0.082**	0.007	0.096**	0.007	0.061**	0.007	0.077**	0.007	0.061**	0.007

		2002		2003		2004		2005		2006		2007	
	1 year Graduate Certificate	0.116**	0.012	0.123**	0.012	0.128**	0.011	0.119**	0.011	0.121**	0.011	0.117**	0.011
	4 year Degree											0.066*	0.027
CURRENT STATUS	Job Related	0.092**	0.01	0.103**	0.01	0.071**	0.009	0.082**	0.009	0.075**	0.009	0.074**	0.009
(Reference: Work Not Related)	Job Partially Related	0.045**	0.013	0.031**	0.012	0.017	0.012	0.024*	0.012	0.039**	0.011	0.046**	0.011
JOB REQUIREMENT	high school education or less	-0.176**	0.009	-0.174**	0.009	-0.165**	0.008	-0.167**	0.008	-0.178**	0.008	-0.191**	0.008
	partial PSE	-0.034**	0.01	-0.014	0.01	-0.021*	0.009	-0.049**	0.01	-0.016	0.009	-0.042**	0.01
(Reference: Diploma/ Certificate/ Trade)	Complete Degree	0.064**	0.018	0.076**	0.018	0.035*	0.017	0.091**	0.016	0.079**	0.015	0.068**	0.013
	Others	-0.104**	0.014	-0.109**	0.014	-0.097**	0.014	-0.123**	0.014	-0.095**	0.015	-0.08**	0.014
COLLEGE SKILLS HELPFUL GETTING JOB (1: helpful/extremely helpful; 0: neither/not helpful/not at all helpful)		0.017	0.01	0.029**	0.01	0.012	0.01	0.007	0.01	0.019*	0.009	0.015	0.01
EDUCATION SATISFACTION	courses contents	-0.002	0.01	-0.004	0.01	-0.02*	0.01	-0.015	0.01	-0.006	0.01	0.008	0.011
	courses up-to-date	-0.005	0.01	-0.008	0.01	-0.008	0.01	-0.017	0.011	0.005	0.011	0	0.011
(1: satisfied/very satisfied; 0: neither/dissatisfied/very dissatisfied)	overall quality of instruction	-0.015	0.01	-0.028**	0.01	-0.01	0.01	0.001	0.01	0.013	0.01	-0.008	0.01
	equipment up-to-date	-0.013	0.008	-0.018*	0.008	-0.026**	0.008	-0.02*	0.008	-0.03**	0.008	-0.008	0.009
	preparation for the job market	0.021**	0.008	0.024**	0.008	0.036**	0.008	0.024**	0.008	0.019*	0.008	0.021*	0.008
	skills developed in Co-op etc.	0.012	0.008	0.012	0.008	0.018*	0.008	0.021**	0.008	0.021**	0.008	-0.009	0.008
SATISFACTION OF SKILL PREPARATION	Personal/Interpersonal skills	-0.01	0.022	0.019	0.022	-0.021	0.022	0.037	0.021	-0.001	0.02	0.018	0.021
	Preparation for specific job	-0.025	0.02	-0.011	0.02	-0.016	0.019	0.02	0.019	-0.013	0.018	0.01	0.02
(1: satisfied/very satisfied; 0: neither/dissatisfied/very dissatisfied)	Communication skills	0.039*	0.017	0	0.018	0.036*	0.017	0.025	0.017	0.017	0.017	-0.008	0.017
	Critical Thinking / Problem Solving/ Information Management	-0.003	0.012	0.007	0.012	-0.007	0.011	-0.006	0.011	-0.008	0.011	-0.024*	0.011
	Numeracy	-0.011	0.01	0.001	0.01	-0.014	0.009	-0.012	0.009	-0.017	0.009	-0.007	0.009
IMPORTANCE OF SKILLS AT WORK	Personal/Interpersonal skills	0.014	0.018	0.014	0.018	0.027	0.019	0.044*	0.018	0.015	0.017	0.03	0.018
(1: important/extremely important; 0: neither/not	Preparation for specific job	0.013	0.016	0.016	0.016	0.018	0.016	0.035*	0.016	0.023	0.015	0.04*	0.016

		2002		2003		2004		2005		2006		2007	
important/not at all important)	Communication skills	0.044**	0.016	0.021	0.017	0.046**	0.017	0.05**	0.016	0.025	0.016	0.004	0.017
	Critical Thinking / Problem Solving/ Information Management	0.047**	0.012	0.058**	0.012	0.042**	0.011	0.034**	0.012	0.039**	0.011	0.036**	0.012
	Numeracy	0.002	0.012	0.007	0.012	-0.013	0.011	-0.006	0.011	-0.017	0.011	0	0.011
INTERACT TERMS OF SATISFACTION AND IMPORTANCE OF SKILLS	Personal/Interpersonal skills	-0.01	0.023	-0.024	0.023	0	0.023	-0.023	0.022	0.002	0.021	-0.025	0.022
	Preparation for specific job	0.021	0.021	-0.015	0.021	0.025	0.02	-0.022	0.02	0.003	0.019	-0.008	0.021
	Communication skills	-0.042*	0.019	-0.001	0.02	-0.043*	0.019	-0.035	0.019	-0.017	0.018	0.03	0.02
	Critical Thinking / Problem Solving/ Information Management	0.002	0.014	-0.022	0.014	0	0.013	0.008	0.014	0.002	0.013	-0.001	0.014
	Numeracy	-0.006	0.014	-0.014	0.014	-0.003	0.013	-0.021	0.013	-0.007	0.013	-0.018	0.013
FT/PT JOB	full-time working	-0.02*	0.009	-0.024**	0.008	-0.011	0.008	-0.033**	0.008	-0.034**	0.008	-0.024**	0.008
	constant	2.325**	0.033	2.301**	0.033	2.337**	0.031	2.279**	0.031	2.264**	0.031	2.308**	0.03

*Ln of hourly salary was used


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