PROGRAM REVIEW REPORT

on the

CSOM PROGRAM

MARCH, 1995

SUMMARY

The second review of the Computer Systems: Operations and Management (CSOM) Program was considerably more detailed than the first, which took place in 1988, and was further complicated by the simultaneous examination of the CSOM Co-operative Education option. Particularly heartening was the improved response rate to the former students' survey (44% as opposed to 22% in 1988), which indicates an increased loyalty to and appreciation of the program.

The Evaluation Committee found the CSOM Program to be in good health, with a strong Advisory Committee, enthusiastic graduate and co-op placement employers, and a highly motivated faculty. It notes, however, that more rigorous admission and retention measures should be taken to maintain full utilization, and identifies several areas where the program curriculum is in need of adjustment. While it realizes that response to industry trends requires continuous vigilance and action, it compliments CSOM faculty for their efforts to keep the program current in a volatile field. In this context, it makes recommendations relating to the on-going need for professional development and the role of Computing Services in supporting the program.

The review of the Co-op Education Option of CSOM is the first part of a two-part evaluation that will culminate in a separate report on Co-op Education (the second part is the Electronics Program Co-op Option Review, scheduled for completion in June, 1995; the conclusions and recommendations emerging from these two reviews will then be synthesized into a report on Co-op Education). The findings in this report on Co-op Education are therefore of a preliminary nature, but nonetheless provide some direction to that department on what its priorities should be: refocusing of its mission and mandate; normalization of its relations with the Registry, Academic Advising and Financial Aid; re-thinking of its data gathering priorities and the uses to which it puts those data; formalization of its reporting procedures, particularly with the programs it serves, and of its policies and procedures in relation to students, employers, and its own co-ordinators; and physical integration into the Student Services Division.

CSOM
PROGRAM REVIEW

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EVALUATION COMMITTEE LIST:

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Dan O'Reilly,
Instructor, Philosophy

ASSISTANT CHAIR

Ted Wykes,
Instructor, Events & Conventions

EXTERNAL REPRESENTATIVE

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INTRODUCTION

The review was initiated August 23, 1994, with requests for historical and contextual data from Richard Oleson, Dean, Business Computing & Mathematics, Brenda Mathews, Chairperson, Computing, and Jack Mathews, Co-ordinator, CSOM. Three days later, on August 26th, a similar request was sent to Carole Hebden, Manager, Co-operative Education, as the intent was to evaluate both the conventional and the co-op options of the CSOM program simultaneously.

Meetings on questionnaire design were held with Jack Mathews on September 7th and 29th, and with Carole Hebden on September 1st, October 5th, October 13th and October 21st. Further liaison took place with Jack Mathews on November 16th, and with Carole Hebden on November 17th. The design process was extended beyond normal by the conceptual problem of constructing questionnaires that would elicit data on not only the CSOM program, but the co-operative education program.

Questionnaires were sent to the following stakeholders: CSOM faculty on October 17th; to Employers (both of CSOM graduates and co-op education students) on October 18th; to CSOM Advisory Committee members on October 20th; and to CSOM former students on October 25th; current 1994-95 second year CSOM students had questionnaires administered on November 22, 1994.

Follow-up letters and second surveys were sent to former students on November 14th, to employers on November 15th, and the Advisory Committee members on November 17th. Attempts were made to contact non-respondents by telephone between November 28th and December 15th. Cut-off date for all responses was December 20th, 1994; the Program Evaluation Committee met to analyze the summarized data on January 19th and 20th, 1995.

BACKGROUND

The CSOM Program was started at Cariboo College (as it was then) in September, 1981, and is now in its fourteenth year. From modest beginnings (16 students, one full-time instructor) it has burgeoned to 55 funded FTE and eight full-time and part-time faculty. The original curriculum heavily emphasized mathematics and business management and was totally mainframe (PDP 11/40) oriented. In 1983, prompted by the realization that the "target niche" for graduates was "junior programmer" rather than "manager", the program's emphasis shifted to computer expertise, complemented by management, English and accounting courses.

The late eighties and early nineties saw several significant changes: the introduction of fourth generation technology in the late eighties; a shift away from mainframe towards microcomputer hardware and software instruction; and, in 1991, the initiation of a co-operative education option. Co-op students take two years and eight months, including three work terms, to complete the CSOM diploma, while conventional students do so in two years.

Although some common ground exists between CSOM and other computing programs in the province, and although the University of Victoria accepts transfer of most CSOM computing courses, it is a program of unique configuration. Its graduates are in high demand and between 70% and 100% of them obtain employment, depending on market conditions.

ADMISSIONS DATA AND PERFORMANCE STATISTICS

Admissions Requirements:

a) **Educational Requirements**
1) B.C. Grade 12 or equivalent with C+ average.
2) B.C. Math 12 or equivalent (Math 061) with C+ average.
3) 67% on the combined English 12 and Government Exam (within the last 5 years).
or Level 3 on the composition section of the Language Proficiency Index (within the last 2 years)
or Completion of English 050
or Completion of CESL 047 and 048 with a B- or better.

b) **General Requirements**
1) Interview with the Program Co-ordinator or designate.
2) Submission of a completed CSOM admission questionnaire prior to the student interview.

c) **Recommendation**
It is recommended , but not necessary, that students entering this program have some familiarity with computers. This could be obtained by completing Computing 11 or 12 in secondary school, or taking an introductory course at the college level or by the use of a microcomputer at home or at work.

Promotion:

To qualify for promotion, a mark of C or better must be achieved.

Program Capacity:

Program capacity of 55 FTE: 30 in the first year, 25 in the second year. Since 1992 the first year intake has been increased to 36 to offset attrition and boost the survival rate into second year. This has improved to over 90% (in 1992 and 1993), a utilization rate that languished below 80% in three of the four preceding years (1988-91).

Program Demand:

	# Applications	Qualified	Admitted	Wait listed	Not Qualified	Walk away
1992	53	39	35	0	14	4
1993	71	43	36	3	28	4
1994	64	44	36	2	20	6

Demand has been commensurate with supply, although as we can see if we discount unqualified applicants and "walkaways", not in excess of it. The high percentages of unqualified applicants - 26% of all applicants in 1992, 39% in 1993, and 31% in 1994 - prompt the question: why are candidates who are presumably fully familiar with these criteria still submitting their applications when they must realize they are deficient?

CSOM Program FTE Utilizations: 1989 - 1994

	1988	1989	1990	1991	1992	1993	1994
Funded FTE	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Actual FTE	39.6	43.1	45.7	40.7	52.0	53.1	
Utilization Rate	72.0%	78.4%	83.1%	74.0%	94.5%	96.5%	
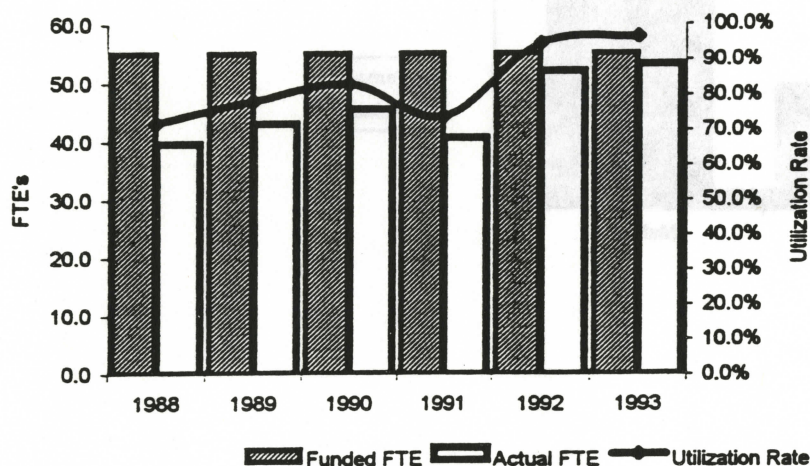
Utilization dipped below 80% three years out of four between 1988 and 1991; in 1992/93 and 1993/94 it improved to 95% and 97% respectively, and in 1994/95 it looks as if it will be better. While the improvement is welcome, it should be noted that the Ministry of Skills, Training and Labour has set 105% utilization as the standard of "good performance" and that for the past two years (1992/93 and 1993/94) the utilization rates for all UCC Career/Technical programs were 121% and 124% respectively (see UCC Annual Reports, 1992-93 and 1993-94).

Completion Rates of CSOM Program

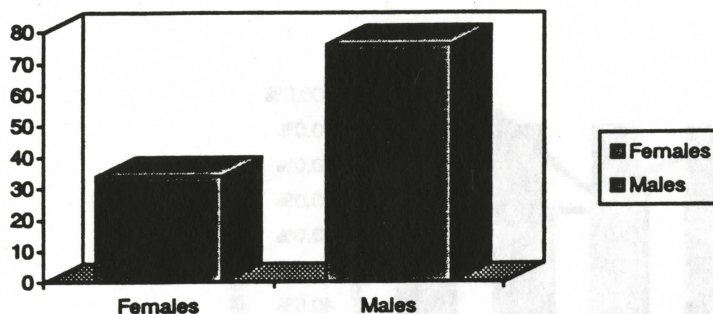|	1991	1992	1993	1994
Fall Enrolment	32	35	36	36
Graduated*			15	21
Completion %			47%	60%
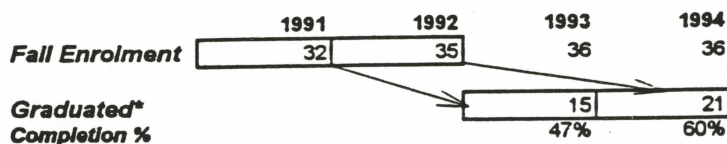
* Counts at Convocations.

3

Gender Ratio:

The gender ratio of students who took the program between 1988 and 1993 is roughly 7:3 in favour of males: of 110 students during this period, 34 were female and 76 male.

1988-1994 CSOM GENDER RATIO

Selected Course Grades in CSOM Porgram

COMP123	A+	A	A-	B+	B	B-	C+	C	D	F	W/DNC	Total
93/94	2	8	1	2	5	1	2		1	1	7	30
92/93	1	2		5	1	2			1	2	5	19
91/92	2	3	1	4	1	3	5	2		1	3	25
90/91			1	2	1	4	1		1	2	4	16
Aggr't'd %	5.6%	14.4%	3.3%	14.4%	8.9%	11.1%	8.9%	2.2%	3.3%	6.7%	21.1%	

COMP256	A+	A	A-	B+	B	B-	C+	C	D	F	W/DNC	Total
93/94	1		2	3	2		1			1		10
92/93		3	2	2	2	4	3	1		1	2	19
91/92	1	2		1		2	3	1		1		11
90/91		4	2	3	2	4	1	2		2	1	21
Aggr't'd %	3.3%	14.8%	9.8%	14.8%	9.8%	16.4%	11.5%	6.6%	0.0%	8.2%	4.9%	

COMP254	A+	A	A-	B+	B	B-	C+	C	D	F	W/DNC	Total
93/94	1		2	2	1	1	3	2	4	2		12
92/93		3	2	4	2		2	1	2	1	1	21
91/92	1				1		4	1	2			9
90/91	1	1	2	2	2	3		1	1	3	1	18
Aggr't'd %	5.0%	6.7%	10.0%	13.3%	10.0%	6.7%	16.7%	6.7%	11.7%	10.0%	3.3%	

COMP263	A+	A	A-	B+	B	B-	C+	C	D	F	W/DNC	Total
93/94	1	9	3	1	1	1	1	1			2	21
92/93	3	2	3	5	3	2	2				1	21
91/92	2	1	2	3	2	3	1					14
90/91	2	8	2	1		1					1	14
Aggr't'd %	11.4%	28.6%	14.3%	14.3%	8.6%	10.0%	5.7%	1.4%	1.4%	0.0%	4.3%	

COMP267	A+	A	A-	B+	B	B-	C+	C	D	F	W/DNC	Total
93/94	1	6	5	3	1	1				1	1	19
92/93	4	3	6	5						2		20
91/92		3	5	4		2						14
90/91		6	8	1	1						1	17
Aggr't'd %	7.1%	25.7%	34.3%	18.6%	2.9%	4.3%	0.0%	0.0%	0.0%	4.3%	2.9%	
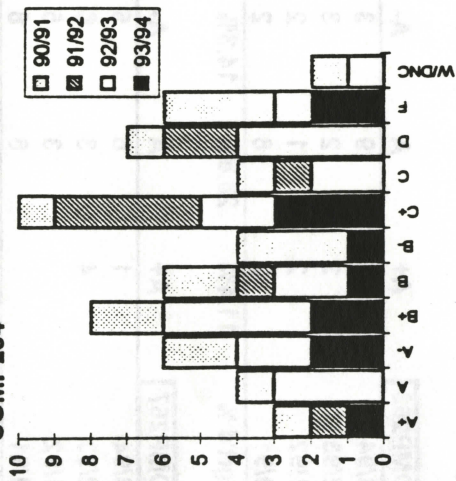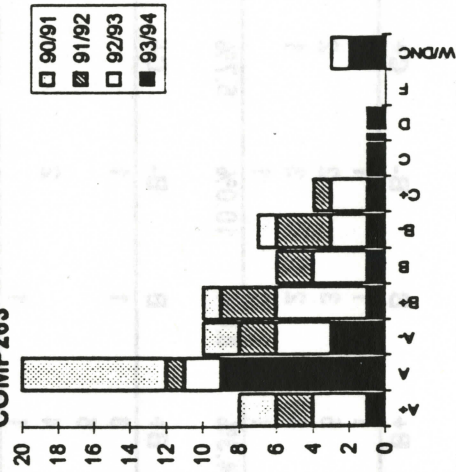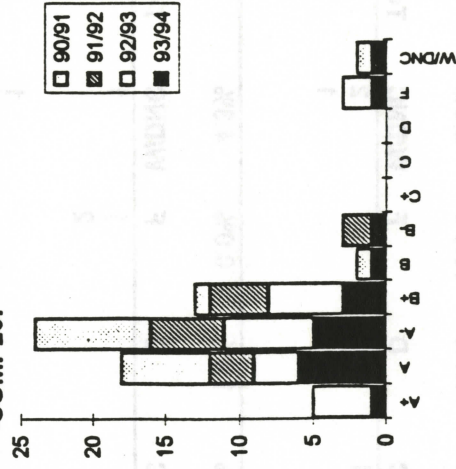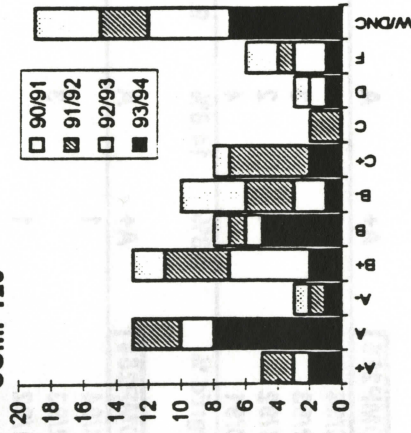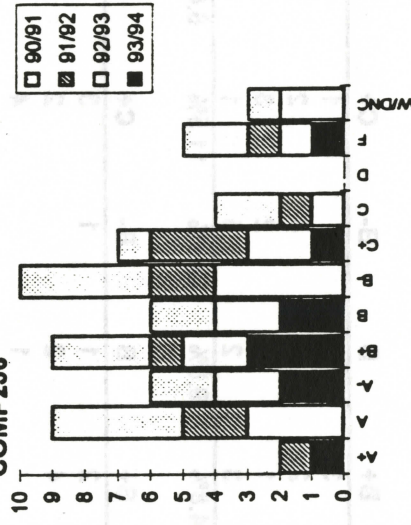
TABULAR SUMMARY OF QUESTIONNAIRE RESPONSES
CSOM PROGRAM REVIEW

The categories and quantities of responses are tabled below:

Recipient	# Sent	# Completed & Returned	% Returned
Employers	52	38	73%
Advisory Committee	05	05	100%
Faculty	08	08	100%
Students:			
- Current 2nd yr.	19	17	89%
- Former	110	48	44%
TOTAL	**194**	**116**	**60%**

Former Students:

Returned by Post Office:	19
Non-Respondents:	43

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SUMMARY OF QUESTIONNAIRE RESPONSES

1. **Advisory Committee**

   All five CSOM Committee Advisory Committee members responded.

   While the Advisory Committee felt its representation was well rounded, with two CSOM graduates, two representatives from Vancouver and one from Weyerhaeuser, and a balance of software and hardware backgrounds, the question was raised as to whether, with Co-op Education playing such a large role in CSOM, the Co-op Co-ordinator for CSOM should be a regular ex-officio member of the Advisory Committee. This would allow the Co-op Education Department to benefit from the Advisory Committee's advice on placements, employer expectations, etc., and to establish contacts in the industry. Some rotation of members every two years was also deemed desirable.

   It was noted that the ratings given by the Advisory Committee to the desirable generic learning and behavioural outcomes listed in question #23 are consistent with the Conference Board of Canada's desired outcomes.

   On service courses, the Advisory Committee recorded some desire that the emphasis in the Mathematics and Statistics courses be on problem-solving and application rather than "pure math"; and that in English, more emphasis be placed on basic writing skills and less on word-processing and job search and resumé writing.

   It was felt that in the computing area, the biggest concern was the levels of service and maintenance provided by Computing Services. Faculty reported that several computers in the computing lab have been down frequently in the past year, and that the multi-media course experienced software that would not run.

   The Advisory Committee also registered its concern about levels of funding to ensure instructor currency in a volatile and changing field.

2. **Employers:**

   Of 52 employers of CSOM graduates and Co-op placement students, 38 responded for a response rate of 73%.

   Most employers rated the generic outcomes exhibited by CSOM graduates at 4 or above on a 5-point scale (where 5 is "very satisfied" and 1 is "very dissatisfied"). The exception was writing skills, which earned a 3.65 rating for Co-op graduates and a 3.31 rating for Non-Co-op. Interpersonal skills (3.85), oral communication skills (3.77), and self-directedness (3.92) also rated below 4.0 for Non-Co-op graduates. In general, with the exception of willingness to learn new concepts, problem solving skills and math and computational skills, Co-op graduates were rated on average 0.30 higher than Non-Co-op on a 5-point scale.

   Considerable input was received from employers on the CSOM curriculum. Among the areas where improvement was requested were LAN expertise (11 mentions); technical writing (5 mentions); DOS troubleshooting (4 mentions); Windows troubleshooting (3 mentions); business skills (3 mentions); and P.C. skills, Excel and databases (each 2 mentions).

   Principal among the suggestions for deletion or de-emphasis was COBOL (3 mentions).

   There were several very positive comments on the program and its graduates.

3. **Former Students:**

Of 110 students who left the program between 1989 and 1994, 48 responded for a response rate of 44%. This compares favourably with a 22% response rate from former students in the 1988 CSOM review and indicates a much stronger interest in the program by its graduates.

Among the demographic information of note was the gender ratio of 2:1 (male to female); the age ratio of approximately 6 over-24 graduates to every 4 under-24; and percentage of graduates who had some post-secondary experience before enrolling in the program. Seventy-six percent of respondents were gainfully employed in full or part-time capacities, and only 5% were unemployed. The mode salaries were in the $2001-$2500 range (17% respondents), $2501-$3000 (17%), and $3001-$3500 (13%). Some 44% of respondents evinced definite interest in taking a Bachelor of Applied Computer Science, with 42% unsure and 14% definitely not interested.

The principal concerns were overall workload (3.16 on a 5-point scale, where 5 is "very satisfied" and 1 is "very dissatisfied"; quality of texts and printed materials (3.40); adequacy of facilities (3.40); and adequacy of equipment and supplies (3.12).

Among the suggestions for addition to the curriculum were LAN (11 mentions; a LAN course is now being offered at second year level as of Winter, 1995); DOS/OS/UNIX (6 mentions); PC software installation (5 mentions); Windows programming (4 mentions); and relational databases, PC troubleshooting and PC technical aspects and installation (3 mentions each). Most of these have been or are in the process of being implemented. The most common suggestion for deletion or reduction to one semester was COBOL (5 mentions) even though a case can be made for its retention as a tool for teaching programming structure.

COMP 264 (Information Systems) was reported as the hardest course (8 mentions), followed by COMP 157/167 (COBOL) (6 mentions) and COMP 113/123 (MODULA) (4 mentions).

Top among future training needs identified by former students were LAN (24 mentions); communications (modems) (3 mentions); PC technical aspects and installations (7 mentions); Windows programming (6 mentions); OOP (5 mentions); and relational databases (4 mentions).

The former students' subjective comments focused on several issues:

1. the heaviness of the workload, complicated by duplicate and redundant assignments (6 mentions); specific classes were singled out for disapproval in this respect, but several graduates argued that such demands were good preparation for the workplace;

2. in spite of a few nay-sayers, the program received kudos on its general excellence;

3. some comments were made on the frustrations experienced with hardware and software in the labs;

4. some comments were received on favouritism and diversity of marking within the program.

4. **Current Students—Second Year:**

Only second and third year CSOM students were surveyed as first year students would not have had sufficient experience of the program at point of survey (November, 1994) to evaluate it meaningfully. Of 19 second and third year students, 17 were surveyed in class on November 22, 1994, for an 89% response rate.

4. **Current Students—Second Year** (Continued)

Forty-one percent of respondents were under 24 and 59% over 24, confirming the hypothesis that CSOM attracts a considerably older student than many other programs. The 2:1 ratio of male to female again prevailed, with 65% male and 35% female students. Sixty-three percent had been out of school for a year or more before entering CSOM, and 82% had post-secondary experience prior to the program. Fifty-three percent of the class reported definite interest in a degree in Applied Computer Science and 47% were unsure (as compared with 44% and 42% respectively of former students).

The data revealed that CSOM students do not use Counselling Services much. Less than a third of the class had used academic advising, and only two or three had used career counselling, personal counselling and the Career Resource Centre.

Current students were considerably more critical than former students of the CSOM program. Workload (2.88), general level of instruction (3.41), effectiveness of the program in developing positive attitudes (3.29) and written communication skills (3.29), quality of texts and printed materials (2.71), appropriateness of methods of evaluation (3.30), and fairness and consistency of evaluation (2.65) all received ratings of less than 3.50 on a scale of 5, where 5 is "very satisfied" and 1 is "very dissatisfied". The particularly low satisfaction ratings on workload, quality of printed materials and fairness and consistency of evaluation were noted.

Suggestions for additions to or greater emphasis in the curriculum included more instruction in hardware (5 mentions); C++ (3 mentions); and PC based languages, DOS, networking, software, organizational behaviour and interpersonal skills were also cited. Other changes suggested were less COBOL (twice) and the deletion of Math 110.

COMP 254 (Management Information Systems) and COMP 253/263 (Small Systems Hardware and Software) were identified as the two toughest courses, with four and three mentions respectively.

Skills required for the future included LAN management and architecture (10 mentions), hardware skills (6 mentions), and communications (modems) (3 mentions). Visual Basic and C++ each received two mentions.

The subjective comments revealed a concern with an appreciation of the following:

1. the heaviness of the workload (6 mentions);

2. the level of support and maintenance provided by Computer Services (4 mentions);

3. CSOM's worthwhileness (2 mentions).

Some individual instructors were complimented for their expertise and teaching skills, while others were criticized for disorganization and unpreparedness.

5. **Faculty:**

Eight faculty members--five from Computing Science, three teaching service courses--completed the faculty questionnaire for a 100% response rate.

The ratings given to CSOM by faculty generally pointed to a high level of morale: faculty feel that this is a strong program and enjoy teaching in it. Their perception was that the graduation rate of 50%-60% was satisfactory, as was the employment rate of 75%-85% of graduates. There were suggestions, however, that the first year intake be reduced from 36 to 30 (q.v. the perennial utilization problem) and that tighter screening take place.

5.	**Faculty** (Continued)

On generic and behavioural outcomes, all mean ratings were 4.0 or above on a 5-point scale (where 5 is "very satisfied" and 1 is "very dissatisfied"), with the following exceptions:

- writing skills: Co-op graduates (3.80); Non-Co-op (3.60);
- willingness to assume responsibility: Non-Co-op (3.80);
- judgement: Non-Co-op (3.80);
- adaptability to change: Non-Co-op (3.80);
- ability to take direction: Non-Co-op (3.60).

Like the employers, faculty demonstrated an average bias of 0.30 per item towards Co-op graduates over Non-Co-op graduates.

While faculty had several suggestions for additions to the program--LAN, account information systems, more small systems, up-to-date languages, data communications, MS Office, and more writing skills-- they conceded that the program cannot respond to all demands. COBOL and RPG were mentioned as candidates for retirement.

While the positive impact of the Co-op option was acknowledged, there were calls for more placement positions and a re-sequencing of the Co-op time pattern and CSOM courses. The Evaluation Committee discussed possible models, such as the Selkirk, Okanagan and Fraser Valley models, and encouraged the Co-op Manager and the CSOM Co-ordinator to do likewise. The possibility of a trimester system at UCC in 1996 was also mentioned.

Two major concerns were the timely installation and servicing of hardware and software by Computing Services, and the availability of professional development monies.
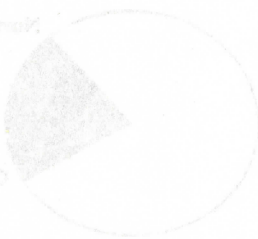
EMPLOYMENT PROSPECTS

Types of Employment:

The "target job" is junior programmer, but other positions accessible to CSOM graduates are programmer/analyst, consultant, instructor, computer operations manager, computer and software salesperson, and office systems support person.

Nature of Work:

Typically, CSOM graduates work in an office with computerized operations designing and/or implementing computer systems and procedures. They apply a methodical approach to solving problems using computers. Most of these problems are business or government-related and pertain to record-keeping - for example, inventory control or accounting.

B.C. Job Prospects:

The information explosion has created new openings for database managers, systems engineers, software engineers, programmers and other information scientists. Increasing use of computer technology across all industries has generally favoured employment growth for programmers and software technicians. Employment is concentrated mainly in the business services sector (37%), manufacturing (10% and growing), and government (9% and growing). The UCC CSOM program's male: female ratio of 7:3 is fairly representative of the gender breakdown in this occupational group: in B.C. as a whole, women make up almost one-third of programmers and systems analyst professionals.

B.C. Employment Trends & Projections

	1981	1987	1995
Number Employed	4.760	7.320	8.380

Annual Growth 1987-1995: 1.7%

Main Industries of Employment 1986 Census
Business Consulting	37%
Manufacturing	10%
Government	9%

Estimated Job Openings in B.C. 1987-95
Growth (Net)	Attrition	Total
1.060	490	1.550

Employment by Region

Lower Mainland 77%
Northern B.C. 2%
Vancouver Island 17%
Okanagan/Kootenay 4%
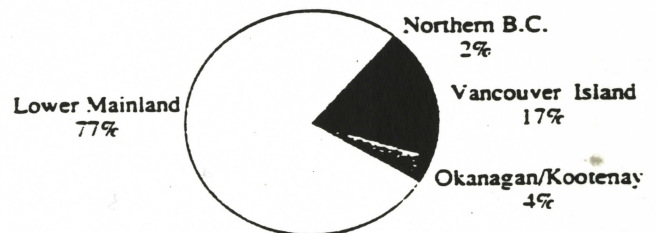
Further Education Opportunities:

The UCC CSOM Diploma is by no means a terminal qualification. At the University of Victoria, it can be fully credited towards a Bachelor of Municipal Management, and for those wishing to parlay it into a B.Sc. in Computer Science, 13 credits are transferable. SFU accepts 11 credits towards a degree, and UBC will negotiate transfer on an individual course basis. At UCC, there is some "cross-over" flexibility for CSOM students wishing to take second, third and fourth year academic computing science courses.

Employment Rates of Former Students:

Present Activities of Former Students

Student P/T+Work P/T
4%

N/A 12%

Student F/T
6%

Employed P/T 7%

Unemployed 5%

Other 2%

Employed F/T 65%
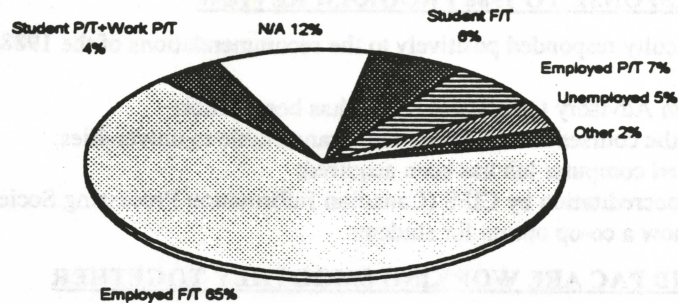
Relationship of Training to Employment:

Jobs Related to UCC Training?

N/A
21%

To a great extent
45%

Not at all
15%

Some extent
19%
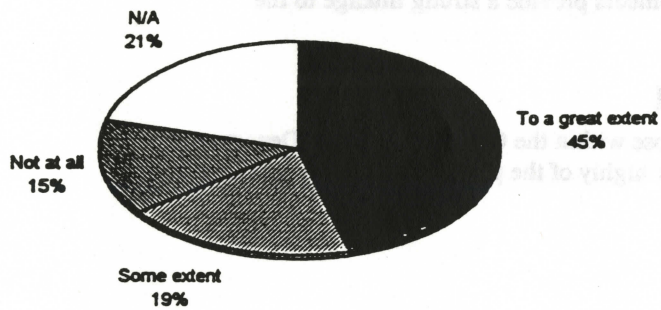
Was Your Job Related to Education at UCC?
All Career/Tech & Vocational Students

Not related at all
21%

Job highly related
46%

Job related to some
extent
33%
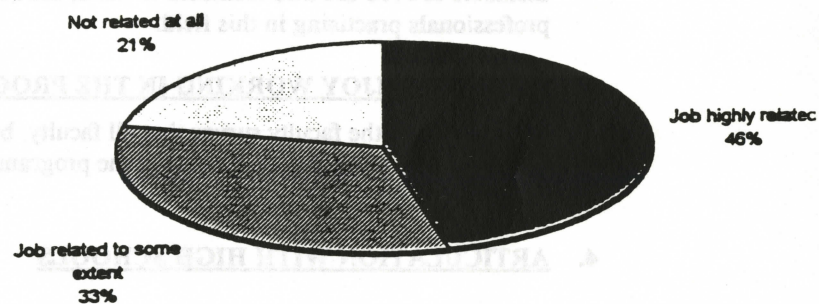
Current Salaries:

Monthly Salary of Former Students

$1,000-$1,500
6%

$1,500-$2,000
4%

N/A
33%

$2,000-$2,500
17%

$2,500-$3,000
17%

$3,500 +
10%

$3,000-$3,500
13%
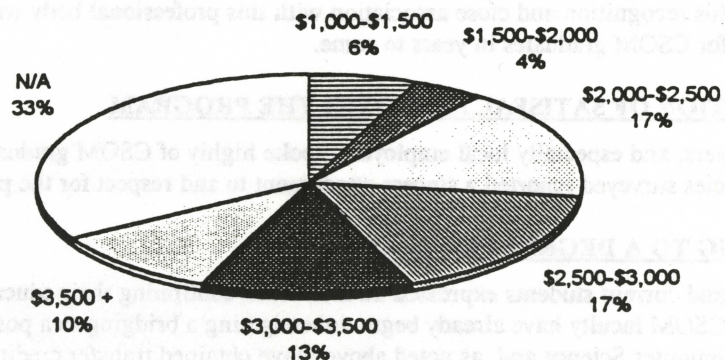
STRENGTHS OF THE PROGRAM

The Evaluation Committee identified the following strengths in the CSOM Program:

1. POSITIVE RESPONSE TO 1988 PROGRAM REVIEW

The program faculty responded positively to the recommendations of the 1988 program review; for example:

- a Program Advisory Committee (PAC) has been struck;
- many of the courses in CSOM are now transferable to universities;
- a dedicated computer lab has been acquired;
- external accreditation by CIPS (Canadian Information Processing Society) has been achieved;
- there is now a co-op option for students.

2. FACULTY AND PAC ARE WORKING SMOOTHLY TOGETHER

The faculty, with active support and encouragement from the PAC, are meeting emergent needs of the program: e.g., by obtaining the equipment needed for a small demonstration LAN; by investing the time and energy in introducing computer languages, e.g., C and C++; as well as new computer hardware, e.g., multi-media, LAN's.

It is also clear from the survey results and discussions at the program review meetings that the Program Advisory Committee is providing useful and considerate advice to the program. As most members of PAC are also members of CIPS, the PAC members provide a strong linkage to the professionals practising in this field.

3. FACULTY ENJOY WORKING IN THE PROGRAM

It is clear from the faculty survey that all faculty, both those within the Computer Science Department and those providing service courses to the program, think highly of the program and enjoy working in it.

4. ARTICULATION WITH HIGH SCHOOLS

The program is to be complimented on having developed strong linkages with regional high schools, which enhances its recruitment of students.

5. ASSOCIATION WITH CANADIAN INFORMATION PROCESSING SOCIETY (CIPS)

The CSOM program enjoys external accreditation with CIPS. Few programs in Canada have achieved this recognition and close association with this professional body will assist in providing job prospects for CSOM graduates in years to come.

6. REPUTATION OF SATISFACTION WITH THE PROGRAM

All employers, and especially local employers, spoke highly of CSOM graduates, and all constituencies surveyed reported a sincere attachment to and respect for the program.

7. BRIDGING TO A DEGREE PROGRAM

Both past and current students expressed an interest in continuing their education beyond the CSOM diploma. CSOM faculty have already begun investigating a bridging to a possible Bachelor of Applied Computer Science and, as noted above, have obtained transfer credit with universities in B.C.

AREAS OF CSOM WHICH CAN BE IMPROVED
(WITH RECOMMENDATIONS)

This section highlights aspects of the CSOM program which the data suggests can be improved.

1. PROGRAM OBJECTIVES AND CALENDAR ENTRY

The current calendar entry should be improved by revising the entry (page 76 of 1995-96 Calendar) from:

"A graduate from this program should expect to find employment as a computer programmer ... "
to
"Career opportunities may include computer programming, computer operations, systems design or systems management."

ACTION: CSOM CO-ORDINATOR

2. PROGRAM ADMISSION AND RETENTION

The data indicate that the dropout rate between first and second year is high (refer to page p.3) and the *utilization rate*[1] is low.

Since 1988 the CSOM program has delivered in the 72 % to 97% utilization rate range with the trend improving in the last few years. The single most important factor affecting CSOM's utilization rate is the dropout of students between first and second year (between 40% and 70% in the last four years). In fact, the utilization rate will probably decrease this year, from a high last year of 97%, because of the dropout rate of current first year students. In order to increase the utilization rate of the program, as well as to reduce the dropout rate of first year students, it is recommended that the program do the following:

2a • Tracking:
The program should track the reasons for students dropping out between first and second year by conducting exit interviews.

ACTION: CSOM CO-ORDINATOR

2b • Revise and Add to the Recommended Requirements of the Program:
The statement identifying the recommended skills for entry into the program (page 77 of 1995-96 Calendar) should be revised to emphasis a recommended background equivalent to High School COMP 12 or UCC COMP 060, keyboarding, DOS, and knowledge of an advanced word processing program. Though these are not **required** skills and courses, anyone lacking this background should be forewarned of the difficult nature of the program. This should be included in a student pamphlet (see next recommendation).

ACTION: CSOM CO-ORDINATOR

2c • Pamphlet:
A prospective students' pamphlet should be prepared outlining the intense workload of the program. This pamphlet should include the recommended required skills for success in the program (see above recommendation). Included in the pamphlet should be a suggestion that students take a study skills course.

ACTION: CSOM CO-ORDINATOR

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[1]   *Utilization rate* refers to actual seats divided by funded seats. For CSOM this is roughly calculated by adding together the number of first year students and second year students and then dividing by the funded FTE's for the program (see chart on page p.3).

2d ● **Articulation with High Schools:**
Program faculty have already taken initiative in this area by articulating their program with local high school computer science teachers. This initiative should be continued with the following focus: those high school students currently taking computer science who have the potential to be successful in CSOM should be contacted and made aware of the program. As suggested by CSOM faculty, seats in the program might be reserved for select high school computer science students.

ACTION: CSOM FACULTY

3. CURRICULUM

3a ● **General Principles:**

· The following general principles guide the recommendations in this section.

As this is an applied program, every effort should be made to ensure that theory links with application.

In order to meet the needs of both incoming students and previous students, and to tie in with the potential bridging to an applied bachelor's degree in Computer Science, university transfer should be obtained whenever and wherever possible.

Students entering the program should have a general understanding of and exposure to computers, DOS, and keyboarding. It is strongly recommended that those applicants without such exposure should obtain it prior to beginning the program. (See recommendation 2b.)

3b ● **Workload:**
Though former students consider the workload of the CSOM program more sympathetically and nostalgically than current students, workload is a major concern for both constituencies. The Evaluation Committee recommends that:

3b i the CSOM faculty review the program curriculum as a whole with an eye to reducing program workload by cutting back on excessive assignments and eliminating duplication. The review should attempt to address the issues identified in 3c through 3eii below.

ACTION: CSOM FACULTY

3c ● **Service Courses:**

General Statement
In order to ensure the relevancy of course content to theory, there should be co-ordination of course content between applied programs and other departments that offer service courses for these programs. As well, yearly meetings should be held between CSOM faculty and service course faculty.

ACTION: CSOM COORDINATOR, CSOM
SERVICE COURSE FACULTY

3c i **English**
The coordinator of CSOM and the Program Advisory Committee should meet with the English Instructor and revise the course content of the two English courses (English 155/165), with the purpose of increasing the grammar and composition content, and obtaining university transfer standing for the courses. This may include removing the word-processing and program documentation components of the course, and the resumé writing and interviewing module.

ACTION: CSOM PROGRAM ADVISORY
COMMITTEE; CSOM CO-ORDINATOR;
CSOM ENGLISH INSTRUCTOR

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3c ii   **Resumé Writing and Job Readiness**
The Co-op coordinator should investigate creating a 1 or 1½ credit course that would teach resumé writing, job interview and job readiness skills. This course would be required for CSOM students and its timing would be coordinated with the work term placement. The CSOM faculty is also encouraged to request that Student Services extend their offerings in job search and interview skills.

ACTION: CO-OP CO-ORDINATOR; CSOM FACULTY

3c iii   **Math**
The content of the math course should be made more relevant for the CSOM students by (a) changing the content of current course, (b) substituting another math course, or (c) substituting another problem solving course.

ACTION: CSOM CO-ORDINATOR, CSOM MATH INSTRUCTOR

3d •   **Computing Courses:**

3d i   **Modification to COMP 157/167**
The intent of COBOL I and COBOL II is to teach the fundamentals of computer programming and COBOL is an especially efficient language for this end. The CSOM Co-ordinator is encouraged to emphasize the principles of programming rather than COBOL itself. The course names COBOL I and COBOL II should also be renamed to indicate the relation of these courses to programming theory.

ACTION: CSOM CO-ORDINATOR

3d ii   **RPG (Report Generating Program)**
RPG should be replaced with a more relevant report writing program or updated to the current version.

ACTION: CSOM CO-ORDINATOR

3d iii   **Windows—Application Packages**
In coordination with the PAC, more WINDOWS languages and 4th GL's have recently been added. When rethinking the sequence of courses for co-op students (see below), an attempt should be made to ensure that exposure to these programs comes before placement.

ACTION: CSOM FACULTY

3d iv   **LAN-Lab**
A small space should be provided to set up a LAN-Lab. The equipment should be made available for September, 1995 The CSOM faculty should investigate the possibility of coordinating space with CTEC (where networking is also taught).

ACTION: CSOM FACULTY; DEAN, BUSINESS, COMPUTING, MATHEMATICS; ACTING DIRECTOR, COMPUTER SERVICES

3e • **Other:**

3e i **Reference Material in the Library**
Instructors should insure that copies of their reference material are available in the library.
ACTION: CSOM FACULTY

3e ii **Course Outlines**
Instructors should insure that course outlines are consistent (per UCC Policy Manual), and all should include transferability where obtained. [This recommendation also appeared in the 1988 Program Review.]
ACTION: CSOM FACULTY; CHAIR-
PERSON, COMPUTING SCIENCE; DEAN
BUSINESS, COMPUTING, MATHEMATICS

3e iii **Co-op:**

Along with the Co-op coordinator, the CSOM faculty should revise the sequence of courses to recognize the major role that co-op students now play in CSOM.

ACTION: CO-OP CO-ORDINATOR,
CSOM FACULTY

3e iv **Modem Use**
To assist in management of workload, many students attempt to access UCC's computer network from home. Recently, however, there has been a real problem accessing the system from home. It is believed that this is the result of many students playing games on the INTERNET. Computer Services should investigate this concern and recommend a solution.
ACTION: ACTING DIRECTOR,
COMPUTING SERVICES

4. FACULTY

4a • **Consistency and Fairness in Grading**
Both previous and current students raised concerns around fairness in grading, consistency in marking, and favouritism being shown to some students. Even though few students voiced these concerns in their written comments, the numerical responses indicated that CSOM faculty should be alert to the possibility of a potential problem. It was noted that some of the problem might arise between co-op and non co-op students, in that non co-op students develop a closer bond with CSOM faculty as these students are doing course work while co-op students are in placement. As well, it was noted that there never has been a grade appeal in CSOM, so the problem is probably more isolated and imagined than real. It was noted, however, that though these concerns may only be the perception of a few, the issue should be addressed.

• **Solutions**

4a i **Marking Across Courses**
Grade distribution should be compared across courses on a 4-5 year basis, and discrepancies between courses should be identified, explained and rectified.
ACTION: CSOM CO-ORDINATOR, CSOM
FACULTY

4a ii **Marking Within Courses**
Grade distribution by course should be submitted to the CSOM coordinator at end of each semester, and extreme variances should be explained.
ACTION: CSOM CO-ORDINATOR, CSOM
FACULTY

4a iii   Small Group Instructional Feedback
Small group instructional feedback sessions might become yearly events as quality assurance
measures for both first and second year classes.

> **ACTION: CSOM CO-ORDINATOR, IN
> CONJUNCTION WITH SGIF
> FACILITATORS**

4b •   Lack of Adequate Preparation
A concern was raised by some students that some instructors, at times, were not prepared for the
course material they were presenting. These incidents appeared to arise for three major reasons:
(1) delay in obtaining the required course software and, thus, inadequate preparation time, (2)
frequent downtime in the computing labs, again impacting on preparation time, and (3) the
perception of inadequate funding for PD events. Each of these issues is addressed in the
following recommendations:

4b i   Capital Allocation
The Evaluation Committee recommends that the capital allocation be expedited so as to ensure
the timely acquisition and installation of new hardware and software in computing labs. It
recognizes that UCC is at the mercy of the Ministry as to when capital budget is received, but
feels that the institution might take other steps to hasten the purchasing and acquisition of new
equipment, such as ensuring maximum staffing levels in Computing Services during the critical
months of July through September each year.

> **ACTION: VICE-PRESIDENT,
> ADMINISTRATION & FINANCE; ACTING
> DIRECTOR, COMPUTING SERVICES**

4b ii   Computer Services Support
Both faculty and students voiced their concerns about the ability of Computer Services to service
software and hardware in a timely manner. As mentioned in 4b i above, the lateness of capital
budget allocation each year puts a strain on Computer Services at a time when personnel
traditionally take vacation, but the Evaluation Committee urges Computing Services to engage
extra staff on a temporary contract basis during the overload period of July through September
each year, as those delays in maintenance impact on instructional effectiveness.

> **ACTION: VICE-PRESIDENT,
> ADMINISTRATION & FINANCE; ACTING
> DIRECTOR, COMPUTING SERVICES**

4b iii   Professional Development
One of the concerns of both CSOM Faculty and PAC members is that there is inadequate support
for professional development (PD) to stay current in the applied computer science field. This
concern is especially relevant to applied fields where technology is changing yearly.
Consequently, instructors may be just learning the material that they must then immediately
teach their students.

On the one hand, the Dean of Business/Computing/Mathematics noted that his division has
higher per faculty PD funding than other divisions, because profit from Extension Service
courses is used to boost the institutional funding of $250 per faculty. He also noted that this fixed

PD fund can be supplemented by application to other UCC funding sources, such as the Leave
Fund. In fact, since 1992 all eight faculty from CSOM who have applied for PD funds all have
received approval for funding to a total of $28,000 (see **Appendix B, PD Expenditures/
Support**). Finally, a Committee member noted that faculty are provided with eight weeks paid
PD each year.

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4b iii   Professional Development (Continued)

On the other hand, the Dean noted that there is an 80/20 split for funding. In other words, application to the PD fund requires that a faculty member pay at least 20% of the total cost of the requested funding. This, it was argued, though demonstrating commitment by the faculty member, places a real burden upon the individual in pursuing expensive courses and conferences and inhibits application for funding. Consequently, many faculty have simply stopped requesting any funding.

Finally, the CSOM Program Review Committee was informed that an outcome of the Institutional Review (1994) will be a revisiting of the issue of PD and that a committee will be struck to examine the issue.

The Evaluation Committee makes two recommendations:

4b iii(a)   that as a general principle, because CSOM is in a rapidly changing field, UCC continue to encourage CSOM faculty to avail themselves of the financial support and leave time necessary for them to stay current;

                                          ACTION: DEAN, BUSINESS,
                                          COMPUTING, MATHEMATICS

4b iii(b)   that, because the CSOM program is subject to high rates of technological change, CSOM faculty be encouraged to work in industry on a regular voluntary basis every three to five years, or to maintain their currency via course work. UCC should provide financial support to assist this type of professional development.

                                          ACTION: CSOM CO-ORDINATOR;
                                          CSOM FACULTY; DEAN, BUSINESS,
                                          COMPUTING, MATHEMATICS

5.   PROGRAM ADVISORY COMMITTEE (PAC)

It was noted by both faculty and advisory committee members that the PAC was operating in a very efficient and cooperative mode. Two recommendations were suggested to ensure the continued beneficial functioning of the committee:

5a •   Co-op Rep be Granted Ex-Officio Status
It was argued that as co-op is playing a major role in CSOM, it is appropriate to include its Co-ordinator on the PAC as an ex-officio member. This would ensure that feedback from all constituencies is addressed in a timely manner and that the PAC is kept apprised of Co-op events and concerns.

                                          ACTION: CSOM PAC CHAIRPERSON

5b •   Membership
It was suggested that the dean expand the CSOM PAC membership to ensure broader based industry input into the program.

                                          ACTION: DEAN, BUSINESS,
                                          COMPUTING, MATHEMATICS

6.   GENERAL

6a •   Tracking of Size of Firms for Grads
It was impossible to identify with any degree of assurance the size of firms which hired CSOM graduates. A method of tracking size of firms hiring graduates should be explored. Such data might assist in identifying the appropriate curriculum.

                                          ACTION: CSOM CO-ORDINATOR

AREAS OF CSOM CO-OP OPTION WHICH CAN BE IMPROVED
(WITH RECOMMENDATIONS)

The data suggest that the following issues pertaining to the Co-operative Education Department should be addressed:

1. CO-OP IDENTITY AND DIRECTION

The history of Co-op Education at UCC suggests a lack of vision and clarity on where the department should be positioned and what its mandate should be. Initially part of the Applied Industrial Technology division (since 1989), the department was moved to the Vice-President, Instruction's office in 1993, and thence to Student Services in 1994. This may be the appropriate place for it in the UCC organization; most other B.C. College Co-op Education departments report to Student Services. The Evaluation Committee recommends that:

1a • since that Co-op Education has found a permanent home, it can re-address its Mission Statement; it should emphasize the <u>instructional nature</u> of its function, and the functions of collaborating and co-operating with faculty in the development of new co-op options for instructional programs.

> **ACTION: MANAGER, CO-OP**
> **EDUCATION**

1b • as already suggested in CSOM recommendation 3c ii, the Co-op Coordinator should investigate creating a 1 or 1-1/2 credit course that would teach resume writing, job interview and job readiness skills.

> **ACTION: MANAGER, CO-OP**
> **EDUCATION**

2. RELATIONS WITH SERVICE DEPARTMENTS

2a • **Public Relations**

Like all instructional departments, Co-op Education has no advertising budget of its own, and therefore relies on Public Relations to perform this function. Co-op Education has been instrumental in reviving interest in and applications to a flagging CSOM program (see table, p.2). But Public Relations has not exploited the drawing power that a Co-op Education option can add to a program, or to the institution for that matter.

2a i The Evaluation Committee recommends that Public Relations highlight the successes and attractiveness of Co-op Education as an advertising tool.

> **ACTION: ASSOCIATE DIRECTOR,**
> **PUBLIC RELATIONS & PUBLICATIONS**

2a ii The Evaluation Committee recommends that the Co-op Education Department consider producing a less expensive brochure that is easier to update.

> **ACTION: MANAGER, CO-OP**
> **EDUCATION; ASSOCIATE DIRECTOR,**
> **PUBLIC RELATIONS & PUBLICATIONS**

2b • **Admissions and Records, Financial Aid and Awards, Advising and Athletics**

The Admissions and Records Departments are nonplussed by the unconventionality of Co-op students: for example, Co-op Education timelines are not synchronized with normal Admissions and Records timelines, and the Co-op workterms were not initially recognized by some departments as instructional semesters.

The Evaluation Committee recommends the following:

2b i   that Co-operative Education explore the possibility of bringing its annual operational schedule in line with the regular UCC operational schedule for student admission, registration, etc.;

ACTION: MANAGER, CO-OP
EDUCATION

2b ii   that Co-op Education hold an information workshop annually with the Academic Advisors, Financial Aid and Awards, and Admissions and Records personnel to explain the anomalies that Co-op Education students will bring to the policies and procedures of those departments, and to prepare personnel to deal with co-op students.

ACTION: MANAGER, CO-OP
EDUCATION

3.   DATA GATHERING, RECORD KEEPING, DATA UTILIZATION

The Committee noted that while the Co-op Education Department monitors and receives feedback from its students and their employers, the focus is on the placement period alone. For example, no data are available on why students are attracted to Co-op Education; these might be useful in recruiting further students. Likewise, systematic tracking of students throughout the whole Co-op experience to pin-point "crucial junctures" and points of exit was not being done. And while data were available on the placement experience, no follow-up was being done to determine graduate placement rates. Accordingly, it is recommended that:

3a   • the Co-op Education Department should review all its data gathering strategies and their raisons d'être, with a view to rationalizing data collection and collecting only data that will be used in aggregate form to trace trends and monitor department performance. The Manager, Co-op Education might be assisted in this review of what data should be collected and how, by CSOM students, who might undertake this task as a class project.

ACTION: MANAGER, CO-OP
EDUCATION; CSOM CO-ORDINATOR

4.   CO-OP PLACEMENT RATES

While the number of Co-op Education job placements is adequate, it can always be improved. UCC needs to secure more placements outside the university-college region, for the region alone cannot absorb all UCC Co-op students. In order to increase the number of placements available for UCC Co-op students, the Committee strongly encourages the Co-op Education Department to maintain UCC job placement candidates' critical edge by ensuring that their resumés and job interview skills are first rate.

ACTION: MANAGER, CO-OP
EDUCATION

5.   REPORTING PROCEDURES

The Natural Resource Science Co-op Co-ordinator participates in NRS Department meetings, while the Electronics and CSOM Co-op Co-ordinators do not. Relations with Advisory Committees vary as well.   The Evaluation Committee recommends:

5a   • that all Co-op Education Co-ordinators become ex-officio members of their respective Program Advisory Committees.

ACTION: CHAIRPERSONS BNRS,
ELECTRONICS AND CSOM PROGRAM
ADVISORY COMMITTEES

5b • that Co-op Education establish formal mechanisms for exchanging information with faculty in the instructional programs they serve. These may be via regular attendance at departmental or program faculty meetings, or via written annual or semester reports to the department chairperson or program co-ordinator.

ACTION: CO-OP EDUCATION CO-ORDINATORS; CHAIRPERSON, BNRS; CHAIRPERSON, ELECTRONICS AND ELECTRICAL; CSOM CO-ORDINATOR

6. POLICY AND PROCEDURE DOCUMENTATION

The Evaluation Committee recommends that:

6a • the Co-op Student Handbook and the Co-op Employers' Handbook be kept current;

ACTION: MANAGER, CO-OP EDUCATION

6b • in addition, Co-op Education should place high priority on developing a Co-op Co-ordinators' Handbook. **ACTION: MANAGER, CO-OP EDUCATION**

7. BUDGET

Two issues were identified under this heading: access to budget information by members of the Co-op Education Department, and the longer term issue of diminishing Federal grants and the prospect of financial stasis by 1997. The Evaluation Committee was apprised that Co-op Education Co-ordinators and staff are not aware of the Co-op Education budget, and recommends that:

7a • Co-op Co-ordinators and staff be provided with updates on non-salary items in the Co-op Education budget. **ACTION: MANAGER, CO-OP EDUCATION**

A more serious issue is the potential "drying up" of external funds. CSOM and TCOM (Telecommunications) are already totally in the base budget; CAST (Computer Automated Systems) and CTEC (Computer Maintenance Technician) will run out of Federal monies in September, 1995; and the Natural Resource Science program's Federal grant expires in 1997. If Co-op Education wishes to avoid stasis, it therefore becomes imperative that it explore further co-op prospects and alternative modes of operation. The Evaluation Committee therefore recommends that:

7b • the Co-op Education Department continue to explore Co-op possibilities, especially in the Applied Technology area, and investigate new models of conducting its business.

ACTION: MANAGER, CO-OP EDUCATION

8. FACILITIES

Two facilities-related issues were dealt with here: the immediate one of the health-hazard presented by Co-op Education's current location, House 8; and the issue of permanent relocation of Co-op Education to reflect its function in the UCC organization.

The Evaluation Committee heard testimony from Co-op Education staff on their poor health since moving to House 8 and their belief that this may be linked to the proximity of the Horticulture Storage Shed, where pesticides are stored. Complaints were also made about the lack of temperature control in House 8: staff have had to move their operating hours from 7:30 am to 2:30 pm in summer to avoid the heat of the day, and in winter the furnace is inadequate to heat the upper floor.

8a • The Evaluation Committee encourages the Co-op Education staff to request that the Manager, Health & Safety, undertake a toxicity study to determine if toxic levels in and around House 8 are hazardous to human heath.

> **ACTION: MANAGER, CO-OP EDUCATION**

If such a study were to confirm the feeling of Co-op Education staff that their health is endangered, it would merely precipitate the relocation of Co-op Education elsewhere. The Evaluation Committee recognizes the marginalization of the current Co-op Education location, both physically and symbolically; it also recognizes the cramped and confined conditions in which Co-op Education currently operates and recommends that:

8b • plans be made to relocate the Co-op Education Department in the retrofitted Block C during 1997, and that it be integrated into Student Services in such a way that it can create linkages with the UCC Graduate Placement Centre, or if the Graduate Placement Centre is to operate as a separate unit, can avail itself of the services provided by that operation.

> **ACTION: VICE-PRESIDENT, ADMINISTRATION & FINANCE; DIRECTOR, STUDENT SERVICES; MANAGER, CO-OP EDUCATION**

APPENDIX A

METHODOLOGY

The data were collected in the following ways:

1) Consultation took place with Jack Mathews, Co-ordinator, CSOM, and Carole Hebden, Manager, Co-operative Education on the design of the questionnaires.

2) Standard questionnaires were administered to CSOM former students, employers, faculty, current students and Advisory Committee members. All data were processed with an SPSSX software program to achieve mean, mode, and standard deviation responses. Verbal comments for each group were recorded separately and anonymously.

3) "Descriptive Data" on the CSOM Program's history, description, objectives, budget, etc. were solicited from Jack Mathews, Co-ordinator, CSOM, and Carole Hebden, Manager, Co-operative Education via the standard "Data Required from Dean/Chairperson/Program Co-ordinator" form, along with course outlines.

4) Statistical data on annual FTE utilization, attrition rates, graduation rates, and grade distribution were provided by the Office of Institutional Research.

5) The following people associated with the program were interviewed:

Brad Worsfold, CSOM Student
David Ranson, Insructor, English
Wesley Cole, Manager, Technical Services

THE UNIVERSITY COLLEGE OF THE CARIBOO

BUSINESS, COMPUTING AND MATHEMATICS DIVISION

CSOM FACULTY *

PD Expenditures/Support

Year	BCM Division		Other UCC (Leave Fund, etc)	Paid PD Time Per Instructor (without teaching responsibilities)
	Requests/Approved	Total		
1992/1993	2/2	$1,095		2 months
1993/1994	6/6	3,522.62		2 months
1994/1995**	2/2	775.62	$9,800.40	2 months +4 months -D Johnson
1995/1996***			$12,851.00	2 months +4 months - BMathews
Total	8/8	$5,393.24	$22,651.40	

*   Jack Mathews, Brenda Mathews and Don Johnson

**   Includes Winter Semester leave for Don Johnson to return to industry.

***   Although total expenditures for 1995/96 will be determined by faculty requests, a one-semester leave of absence has been approved for Brenda Mathews during the Winter Semester, 1996.