

Reviewing and Developing Undergraduate Curricula at SFU: An Abridged Discussion Paper

This paper is an abridged version of a discussion paper that can be found at www.reg.sfu.ca/Senate/Comms/AdHocComms/discussion.html . The primary purpose of this paper is to stimulate discussion about ways in which the undergraduate curricula at SFU can be enhanced. The paper ends by outlining a set of initiatives that the Ad Hoc Senate Committee to Review and Develop the Undergraduate Curricula thought deserved special consideration. The unabridged electronic version of this paper contains more elaborate discussions of the issues summarized in this report, with links to many web sites containing information relevant to the review and evaluation of undergraduate curricula. Sections are numbered to facilitate cross-referencing. Reactions to this paper and ideas for improving our undergraduate curricula can be posted on our web site.

I. INTRODUCTION

A. TERMS OF REFERENCE

The Ad Hoc Senate Committee to Review and Develop the Undergraduate Curricula (hereafter abbreviated to “Curriculum Committee”) was created in the Spring semester of 2001 and charged with two main tasks: (a) reviewing the existing undergraduate curricula at SFU to ensure that they fulfill the principles set out in the University’s Values and Commitments document (VC) and (b) proposing strategies for enhancing opportunities for broad cross-disciplinary learning and ensuring that SFU graduates have the academic preparation for future success.

B. MEMBERSHIP

During the 2001 year, members of the Curriculum Committee were: Kieran Egan (Education), Maureen Fizzell (Business Administration), Dennis Krebs (Psychology), Tina Loo (History), Joseph Peters (Computing Science), Sue Roppel (Academic Relations), Geoffrey Rosen (Student representative) and Michael Wortis (Physics). Elizabeth Nadeau, Laura Farrelly, and Paul Yeung supplied administrative and research support for the Committee. Jack Bates created the web site.

C. PREVIOUS COMMITTEES

During the past two decades, six committees have examined Simon Fraser’s undergraduate curricula. Recommendations made by these committees are summarized in the electronic version of this paper.

D. TASKS UNDERTAKEN

We resolved to fulfill our mandate by (a) gathering information, (b) producing a discussion paper summarizing information we believed relevant to our mandate, (c) seeking feedback from the SFU community about the issues raised in the discussion paper, and (d) “submitting a Final Report to the Senate Committee on University Priorities (SCUP) for discussion and consideration for approval in principle” as prescribed by our Terms of Reference. Following approval in principle by SCUP and subject to favorable reception by Senate, the Vice President, Academic will be responsible for coordinating proposals for implementation, subject to the usual approval processes.

We defined our task primarily as examining the goals and structure of undergraduate curricula at a university-wide level. We did not examine the curricula of particular programs except as they seemed relevant to university-wide issues. Previous committees have made recommendations about

- **The accessibility of the undergraduate curriculum**
- **The efficiency of the undergraduate curriculum**

- **The quality of undergraduate teaching**
- **The responsibility to provide good guidance and mentoring to undergraduate students**

Although we did not focus on these issues, we believe that initiatives aimed at improving undergraduate curricula need to be attentive to interactions among the structure of the undergraduate curricula, the accessibility of courses and other resources, the effectiveness of various modes of delivery and instruction, and the availability of guidance.

E. PRINCIPLES GUIDING THE PROCESS OF CURRICULUM REVIEW AND REVISION

Many universities have reviewed and revised their curricula. There is an extensive literature evaluating the successes and failures of such revisions. Attentive to the experiences of other universities, we resolved to proceed in an open collaborative manner, consult widely, avoid ‘top-down’ impositions, and respect the autonomy of Programs, Departments, Schools, and Faculties in structuring their programs.

F. PURPOSES OF THIS PAPER

In this report, we attempt to answer five main questions: (a) what are the main purposes of undergraduate education, (b) what methods do other universities employ to achieve these purposes, (c) how are our undergraduate curriculum structured at SFU, (d) how well are we doing, and (e) what are the advantages and disadvantages of various strategies? It is important to read this paper in the spirit in which it was drafted, as a *discussion* paper designed to stimulate feedback from the community. Our hope is that support—indeed enthusiasm—will emerge in the university community for initiatives with promise to improve the quality of undergraduate education.

G. HOW THIS PAPER IS ORGANIZED

After outlining the purposes of undergraduate education, we describe and evaluate the strategies universities, including SFU, employ to cultivate foundational thinking and communication abilities and to ensure that students are exposed to the forms of thought and modes of inquiry of more than one discipline. In the penultimate section, we review curriculum models employed by other, mainly Canadian, universities. In the final section, we present for discussion a selection of ideas for improving our undergraduate curricula at SFU.

II. THE PURPOSES OF UNDERGRADUATE EDUCATION

A. INTRODUCTION

The most obvious purpose of undergraduate education is to enhance students’ knowledge of the subjects they study. Undergraduate curricula also should instill in students attitudes conducive to learning, equip them for life-long learning, prepare them to be citizens of a pluralistic, multicultural, democratic society, and enable them to contribute to a diverse, complex, and highly interdependent world in an ethical manner. To achieve these overriding purposes, we distinguish three overlapping goals of undergraduate education: (a) the acquisition of communication and thinking abilities that provide a foundation for life-long learning (which we call “foundational abilities”), (b) an appreciation of the forms of knowledge and modes of inquiry of more than one discipline (which we call “breadth”), and (c) the acquisition of expertise in an area of specialization (which we call “depth”).

B. FOUNDATIONAL ABILITIES

Foundational abilities have been classified in many ways. At the core of virtually all classifications of foundational abilities are communication and thinking abilities.

Among communication and thinking abilities, verbal and mathematical abilities are usually emphasized. As stated in Yale's guidelines for undergraduate studies, "It is axiomatic that educated men and women should be able to express themselves effectively in their own language, both in speech and writing. To suppose that anyone who cannot write clearly can think clearly is an illusion: words are the most basic tools of thought. Those who cannot use them skillfully will be handicapped not only in communicating ideas to others, but also in defining, developing, and understanding those ideas themselves.... Mathematics is the basic language of the natural and social sciences, and has become a useful tool in many humanities. So pervasive are mathematical techniques that contemporary men and women may not consider themselves truly educated until they have an understanding of the fundamentals of mathematics."

In addition to verbal and mathematical abilities, past SFU committees and other universities have included in their purposes to foster (a) critical and creative thinking abilities, (b) research abilities, (c) sensitivity to ethical issues, and (d) personal and social qualities.

C. BREADTH

Breadth of knowledge is an awareness that there are many perspectives and points of view, different ways of thinking, different modes of inquiry, different methods of research, and different kinds of knowledge. Breadth involves learning, comparing, and integrating the basic ideas, forms of knowledge and modes of inquiry from several fields. Past SFU committees have emphasized the importance of breadth, especially as fostered by interdisciplinary experiences, international experiences, and partnerships with outside agencies.

D. DEPTH

Depth of knowledge is a specialized understanding of the fundamental ideas, modes of inquiry, and methods of research in a particular discipline. We say relatively little about specialization in this paper, attending instead to what is commonly called general education.

The Values and Commitments document, past Simon Fraser University committees, and other universities (see Gaff & Ratcliff, 1997, for a review) have endorsed these purposes of undergraduate education.

E. OVERLAP BETWEEN THE PURPOSES OF UNDERGRADUATE EDUCATION AND QUALITIES SOUGHT BY EMPLOYERS

There is considerable overlap between the basic goals of undergraduate education outlined above and the qualities in graduates sought by employers (Jones, 1994; Romer, 1995; Vancouver Sun, Dec. 7th 2000; Allan Report).

III. CULTIVATING FOUNDATIONAL ABILITIES

A. APPROACHES USED BY UNIVERSITIES TO HELP STUDENTS DEVELOP FOUNDATIONAL ABILITIES

Although there is general agreement among post-secondary institutions that the students they graduate should possess the capacity to write and to communicate clearly and effectively, to think critically, to analyze and to solve problems in a variety of environments, and to possess a certain level of competency in mathematics, computing, and research methodology, universities differ significantly in the approaches they employ to help students develop such qualities.

A. 1. Admission Requirements and Entrance Examinations

By setting the bar for admission at a certain level and/or (in relatively rare cases) requiring students to pass an entrance examination testing certain basic foundational skills, some universities shift the burden for cultivating foundational abilities to the secondary school system. (See an article in the *Chronicle of Higher Education*, Feb. 9, 2001, discussing a \$1.2 million project in the USA aimed at the identification of the skills high school students need to enter universities and the development of tests to assess such skills.)

A. 2. Remedial Assistance

Some universities help students develop foundational abilities by offering remedial courses or individual tutoring, usually in writing or mathematics. As an example, UBC offers a remedial course in writing.

A. 3. Skill Development Centres

Skill Development Centres typically provide students with assistance in the development of writing capabilities by way of one-on-one reviews of written work, tutoring, and/or special classes to teach students to write more effectively within the academic environment. Such Centers often offer remedial assistance.

A. 4. Stand-Alone Courses Dedicated to Developing Specific Foundational Abilities

Many universities offer courses devoted to the development of a single skill, often removed from the discipline of inquiry in which students are studying. Most common among such courses are writing, mathematics, and statistics courses. Many universities also offer courses devoted to speech and communication, foreign languages, critical thinking, and ethics.

A. 5. “Skill-Intensive” Versions of Existing Courses that Integrate the Cultivation of Foundational Abilities with the Content of the Disciplines in which They are Offered

Many universities have developed writing-intensive courses. Writing-intensive courses are usually—but not always—offered by the departments dealing with the content in question. For instance, an existing history course or section of the course might be given a “W” designation (e.g., History 101-W) indicating that it will be “writing-intensive;” that is, that it will contain an intensive focus on teaching students to write in the discipline. In a collaborative effort, seven consortia involving forty institutions in the USA are developing teaching approaches and interdisciplinary materials for mathematics education in conjunction with disciplines.

Duke University classifies all skill-intensive courses in its core curriculum with designations such as “writing-intensive”, “research-intensive”, “ethical inquiry” and “quantitative, inductive and deductive reasoning.”

A. 6. Exit Examinations

In response to demands for greater accountability, a number of post-secondary institutions in the United States have instituted exit examinations to ensure their graduates have a certain level of competency in foundational abilities.

B. DEGREE TO WHICH STUDENTS ARE REQUIRED TO DEVELOP FOUNDATIONAL ABILITIES

Universities differ widely in the extent to which they require students to develop foundational abilities and in the approaches they employ. In Canada, the norm is for universities to require relatively few foundational courses, although most Canadian universities require students to take courses in English. Most American universities require undergraduate students to achieve a specified level of competency in writing and in mathematics or quantitative skills. Some universities extend this to include research methodology, second language proficiency, oral communication and/or experiential learning. A few universities identify technological or computing ability as a foundational requirement.

C. HOW WE HELP STUDENTS DEVELOP FOUNDATIONAL ABILITIES AT SFU

At SFU, most courses have pedagogical features that foster foundational abilities, but without a course-by-course examination it is difficult to identify what foundational abilities are fostered in which courses. SFU also provides students with the opportunity to develop their foundational research, essay writing and computing skills through workshops offered by units outside of academic departments, such as the Library, Academic Computing Services, and Student Services.

C. 1. Admission Requirements and Entrance Examinations

In present, SFU admits approximately 5,000 new undergraduate students each year. We have approximately 14,000 annualized FTE undergraduate students and 22,000 annualized head count. We award approximately 3,000 Bachelor degrees each year. Students admitted to SFU come from three main sources: B.C. Secondary Schools (in 2000-2001: 42%), B.C. Colleges and Universities (32%), and Other (26%).

Some admission requirements apply to all students; others vary across categories of admission and units within SFU. The main criterion for admission is academic performance. All applicants whose primary language is not English “must demonstrate a command of English sufficient to meet the demands of classroom instruction, written assignments and participation in tutorials and discussions” (Calendar, p. 29).

Students admitted from **B.C. or Yukon secondary schools** must have passed English 11 and English 12 or Francais Premiere Langue 11 or 12, Language 11 or Introductory Language 11, Principles of Mathematics 11, one or more Science 11 courses, plus “breadth” courses selected from three lists (Calendar, pp. 30-31). Students granted direct entry to the Faculties of Business Administration and Science, and to the Schools of Engineering Science, Kinesiology, and Computing Science also must have Mathematics 12.

Students admitted from **B.C. or Yukon community colleges and other recognized universities** are required to have completed “at least one full year of transferable work with a minimum average of 2.0 or 60%” (Calendar, p. 31). The Faculties of Business Administration and Science, and the Schools of Engineering Science, Kinesiology, and Computing Science have additional requirements. Note that students transferring to SFU are not required to meet the same admission requirements as students entering from high schools. In particular, they need not have graduated from high school and they need not have taken English 12 or Mathematics 11 (although some Faculties and Schools require students to take SFU courses in English, Mathematics and/or other subjects.)

“The University limits new **international students** to not more than 7% of each year’s entry” (Calendar, p. 37).

“Simon Fraser University is interested in extending learning opportunities to **B.C. residents who may not qualify under the regular categories of admission**. The number of such admissions is limited by the availability of resources, and is not automatic. Four categories are available: mature student entry, early entry, concurrent studies, and irregular admission” (Calendar, p. 32).

C. 2. Remedial Assistance

Although we do not offer a remedial writing course, the SFU Language Training Institute offers a 10 week intensive English program, called the English Bridge Program, which is “designed for students who are otherwise fully admissible to the University but who do not completely meet the English language requirements” (Calendar, p. 29). SFU also has a Writing Center that has offered remedial assistance in writing. A committee is currently reviewing the mandate of the Writing Center.

Although we do not offer any formal remedial assistance in mathematics, some departments offer drop-in tutorials and workshops in mathematics and statistics in conjunction with some courses (Calendar, p. 271 and 289).

C. 3. Skill Development Centers

In the past, SFU’s **Writing Center** has provided assistance to students with specific writing assignments. **Student Services** provides workshops for students in the areas of “How to Study,” “Coping with Exam Stress,” etc. The **Learning and Instructional Development Center** plans to contribute to the development of foundational abilities by offering a web literacy program in collaboration with Academic Computing Services and University departments and by offering faculty and graduate students (a) workshops, seminars, conferences and programs on effective instructional methods, (b) personal support and assistance with the design or re-design of courses aimed at emphasizing active learning approaches, and (c) support in helping students integrate the use of technology into their courses.

C. 4. Stand-Alone Courses Dedicated to Developing Specific Foundational Abilities

SFU offers many stand-alone courses designed to cultivate foundational abilities.

C. 5. “Skill-Intensive” Courses that Integrate the Cultivation of Foundational Abilities with the Content of Disciplines

SFU also offers many skill-intensive courses designed to cultivate foundational abilities.

C. 6. Co-op Education Programs

Co-operative education intersperses academic semesters with work experience semesters. SFU’s Co-op program is the fifth largest in Canada, with more than 2000 placements per year.

C. 7. Exit Examinations

SFU does not require any of its students to take exit examinations, but many departments require honours students to do honours projects and theses, some followed by oral examinations.

C. 8. Requirements

C 8. 1. University-wide requirements. Unlike UVic and UBC, SFU does not require students to take specific courses designed to cultivate writing abilities on a University-wide basis. SFU does not have a university-wide mathematics requirement or second language requirement.

C 8. 2. Departmental requirements. There is considerable variation across faculties and majors in the extent to which students are required to take courses specifically designed to foster foundational abilities.

D. HOW WELL DO WE CULTIVATE FOUNDATIONAL ABILITIES AT SFU?

D. 1. Admission Requirements and Entrance Examinations

The level of mathematics required by the Faculty of Arts and School of Communication (Mathematics 11) is not as advanced as the level required by other faculties and departments (which require Mathematics 12).

There is evidence that, on average, B.C. college transfer students do not perform as well as direct-entry B.C. secondary school graduates when they enter SFU. This disparity probably stems from our policy of selecting the best secondary school graduates for direct entry but allowing students with lower grades in secondary school and/or less rigorous courses or programs to enter as transfer students. Transfer students entering some SFU programs also are not required to have taken the same breadth of courses as students entering from secondary school.

Commentary: One way to ensure that the students we admit to SFU have achieved an acceptable level of proficiency in foundational abilities such as mathematics and writing is to require students who have not established proficiency to achieve a particular score on a proficiency test, such as the test used as an assessment tool in our mathematics department, the tests used to assess writing at UBC, or the tests used as an exit examination in our English Bridge Program.

D. 2. Remedial Assistance and Skill Development

SFU once offered a general course—GS 101—designed to help orient new students, but it has been discontinued. A committee chaired by the Dean of Arts is examining the terms of reference of the Writing Center.

D. 3. Courses

SFU offers students plenty of opportunity to cultivate foundational abilities by taking stand-alone and skill-intensive courses. The question is, do our students take a sufficient number of them? As noted above, there is considerable disparity in the number of such courses departments require, and relatively few units require that their students take a coordinated, complementary, or cumulative set of such courses. Because SFU does not have university-wide requirements, some students are able to avoid courses designed to develop foundational abilities. It is possible that students whose foundational abilities, especially in mathematics or English, are most deficient are particularly prone to avoid courses designed to cultivate these skills.

D. 4. Co-op Programs

There is good reason to believe that the Co-op Program at SFU has been very successful. When Co-op alumni were asked to rate, on a scale of 1-7, the usefulness of the skills they developed during their Co-op positions, they gave the following mean ratings: problem solving (6.1), critical thinking (5.7), written communication (5.6), oral communication (5.6), meeting deadlines (5.6), teamwork (5.5), computer facility (5.5) and research (5.4). Previous SFU committees have recommended expanding Co-op opportunities.

D. 5. Conclusions Reached by Previous Committees

In recommending that we change the ways in which we cultivate foundational abilities, past committees have implied that we could do a better job. As examples, PACUP recommended offering fundamental programs devoted to the cultivation of basic skills in learning. (See the electronic version of this paper for the names of committees abbreviated in this section, with relevant links.) PCUP recommended

designing all programs in ways that enable holders of SFU degrees to acquire a set of foundational skills. PCUP further recommended requiring all students to acquire proficiencies in written and oral communication, computer use, and the interpretation and presentation of numerical information. PACUP recommended designing courses, especially lower-levels courses, in ways that cultivate basic skills in learning. VC and CPP recommended integrating more research experience into the curriculum. PCUP recommended that all academic units offer lower-level research seminars. The Ad Hoc Dean of Arts' Committee recommended creating a task force to recommend practical ways of enhancing literacy. SCIMO recommended assigning appropriate amounts of written work in courses, providing adequate feedback to students, and not relying solely on multiple-choice exams.

D. 6. Opinions of Students about the Acquisition of Foundational Abilities: Survey Data

Data from the *Canadian Undergraduate Survey Consortium: Graduating Students Survey 2000* (available from the Office of Analytic Studies) failed to reveal any significant differences between students' ratings of SFU and students' ratings of other Canadian universities with respect to the acquisition of foundational abilities. Like students from other universities, SFU students—especially from the Faculty of Arts—rated SFU relatively low (C+) on the acquisition of Mathematical Skills (compared to B ratings for most other abilities). Engineering Science and Science students rated their programs lower than the mean on written and oral communication.

Data from *The B.C. University 1999 Two-year Follow-up Survey of 1997 Baccalaureate and PDP Graduates (Office of Analytical Studies)* revealed that SFU graduates rated SFU relatively high on cultivating analytic and critical thinking abilities and relatively low on cultivating mathematical skills. Approximately 25% of the students sampled rated SFU low on helping them develop the abilities to work effectively with others, think creatively, and speak well. With respect to differences among faculties, more Education and Arts students than Business and Science students gave low ratings on “ability to use mathematics appropriate to your field” and “ability to solve problems” (but note that almost 20% of Arts students did not find the ability to use mathematics applicable to their field). More Science students than Education students gave low ratings on “ability to think creatively.” More Applied Sciences and Science students than Business and Arts students gave low ratings on “ability to write well” and “ability to speak well” (74% of students in Computing Science (total N = 39) gave low ratings on ability to speak well). More Science and Arts students than Business students gave low ratings on “ability to work effectively with others.”

Preliminary results from the *Fall 2001 SFU Undergraduate Student Survey* revealed that students ranked “develop communication abilities” (98%) and “develop critical thinking and problem-solving abilities” (98%) highest in importance in acquiring a good undergraduate education.

D. 7. Questions and Caveats

The responses of SFU students to the surveys reported above led us to wonder whether some SFU programs could do more to help students develop the ability to work effectively with others, to think creatively, and to speak well. We also wondered whether we should be doing more to cultivate (a) mathematical abilities in Arts and Education students and (b) verbal abilities in Science and Applied Sciences students. At this point, we have little data on the acquisition of other foundational abilities, such as critical thinking. We did not attempt to conduct a thorough assessment of how well the various programs at SFU are cultivating foundational abilities in their students. Such assessments require a significant commitment of time and resources. Another way of approaching the issue is to adopt strategies that have been found by other universities to enhance foundational abilities, perhaps followed up with an assessment of the effectiveness of the methods. We would be interested in hearing what members of the community think about this issue.

IV. CULTIVATING BREADTH

A. INTRODUCTION

To ensure that students are exposed to a range of areas of knowledge, modes of inquiry, and research methods during their courses of study, virtually all universities require students to take courses outside their majors. In addition, many universities support extracurricular experiences such as cooperative education, exchange programs, and field placements in foreign countries.

B. METHODS USED BY UNIVERSITIES TO HELP STUDENTS ACQUIRE BREADTH

B. 1. Courses.

B. 1.1. “Great Books” or “Masterpieces” courses

Such courses focus on aspects of the Western canon of art, literature, philosophy, and music deemed to be part of the cultural capital of an “educated person.”

B. 1.2. Thematically-focused interdisciplinary courses

By organizing a course around a specific theme, such as war, globalization, or climate change, students are introduced to a variety of modes of inquiry, and may learn to appreciate both the distinctiveness of such modes and their potential for a creative synergy across disciplines.

B. 1.3. Courses emphasizing an understanding of other cultures

As one university put it, such courses are designed, “to reveal connections, influences, parallels, and blurry boundaries between cultures as much as to show their partial distinctness.” In so doing, such courses promote “learning and thought about the variety of civilizations and the diversity of traditions that have formed the world and continue to interact in it today.”

B. 1.4. Topical or focus courses for non-majors

Some university departments provide special courses designed specifically to introduce non-majors to significant aspects, issues, or problems in their disciplines. The set of courses offered in the Faculty of Science at UBC supplies a good example.

B. 1.5. “Capstone” courses

Capstone courses—seminars offered in the final year of undergraduate study—aim to bring together the ideas, knowledge and awareness that students have developed over the course of their degrees. These seminars are often interdisciplinary in approach and theme-based or issue-based.

B. 2. Course Clusters or Learning Communities

An alternative to a single interdisciplinary course or a single thematically-focused course, a Learning Community or Course Cluster, is a collection of courses in different departments that are organized around a common theme. The material presented and the assignments required in each seminar in the course cluster or learning community are designed to be complementary. In many cases these independent but related courses are augmented by a common seminar where questions are posed and issues discussed that cross the boundaries of the individual courses. Mark Winston’s Undergraduate Semester at the Morris J. Wosk Center for Dialogue, entitled “Nature, Environment, and Society” is a local example.

B. 3. Programs

Some universities offer entire programs of study dedicated to achieving a general rather than a specialized education. An extreme example is St. John's College, which has a single four-year undergraduate program for all students. The Integrated Learning Center at Queen's University for the study of engineering combines learning of theoretical and practical knowledge in team-based environments.

B. 4. Non-Classroom-Based Experiences

Many universities cultivate breadth by encouraging—and in some cases requiring—undergraduates to participate in cooperative education programs, exchange programs with other universities, and international field placements. For a survey of evidence on the educational benefits of international experiences, see Randall Martin's review of the literature in the electronic version of this paper.

B. 5. Distribution Requirements

At many universities, undergraduate courses are grouped into broad distribution groups (e.g., natural sciences, social sciences, and humanities). Students are required to take a certain number of courses designed to foster foundational abilities as well as a number of courses outside the distribution group that contains their major. Yale University encourages students to sample broadly by allowing them to take some breadth courses on a pass/D/fail basis. Such a system ensures that students do a certain amount of work to a certain standard to receive a “pass”, but students' overall grade point averages are not affected by exploring disciplines outside of their areas of expertise. Other universities achieve the same range of course-sampling by imposing restrictions designed to ensure breadth is achieved. For example, Harvard students must choose breadth courses from areas identified as the *most remote* from their course of study. Many departments at SFU employ a distribution model.

C. ASSUMPTIONS ABOUT THE OPTIMAL AMOUNT OF BREADTH

Breadth requirements at North American universities range from one-tenth (e.g., Cornell University) to one-half of an undergraduate's program (e.g., the University of Chicago). When combined with variation in the way in which breadth requirements are structured, the range in breadth requirements across North American universities is quite remarkable.

V. HOW WE CULTIVATE BREADTH AT SFU

A. INTRODUCTION

It is important to distinguish between the opportunities a university offers students to acquire breadth and the extent to which students avail themselves of such opportunities. In this section we summarize the opportunities SFU offers students, then discuss issues related to the extent to which students avail themselves of these opportunities.

B. COURSES

B. 1. “Great Books” or “Masterpieces” Courses

SFU has three courses in the Humanities—Humanities I, II, and III—entitled Great Texts in the Humanities. These courses cover the time period from ancient to modern times.

B. 2. Thematically-focused Interdisciplinary Courses

SFU has courses in many disciplines that are designed to foster interdisciplinary thinking and discussion.

COMMENTARY: Theme-based courses that span disciplinary boundaries are consistent with SFU's commitment to interdisciplinary studies. Students have indicated considerable support for interdisciplinary-based learning, both at SFU and at other institutions.

B. 3. Courses Emphasizing an Understanding of Other Cultures

SFU has courses in various disciplines that are designed to increase the understanding of other cultures.

B. 4. Topical or Focus Courses for Non-majors

Most programs have introductory 100-level courses that are designed to provide an introduction to disciplines for majors and non-majors.

B. 5. "Capstone" Courses

Very few departments have a capstone course designed to bring together the various facets of the disciplines. One exception is BUS 478—Seminar in Administrative Policy—which is designed to integrate the various areas of business.

C. COURSE CLUSTERS

SFU offers students relatively few course clusters. Exceptions are discussed below.

C. 1. Certificate in Liberal Arts

This program provides a broad exposure to areas of knowledge and methods of inquiry that are considered to be essential to a liberal education (Calendar, p. 126). Students must complete ten courses, which must be spread across 12 categories. The categories are (a) verbal skills, (b) theory and theory building, (c) analysis of contemporary issues, (d) literature, (e) fine and performing arts, (f) culture and civilization, (g) period and place, (h) foundations of social science, (i) social and behavioral analysis, (j) natural science, (k) the impact of science and technology, and (l) quantitative skills. The courses in each of these categories may change from time to time and are listed on the SFU website.

C. 2. Special Course Clusters

The undergraduate semester designed by Mark Winston consists of three linked courses that include discussions, guest visits, extensive reading and several individual and group projects. Students are expected to speak, write, conduct research and interact. Each semester's focus topic is different, involving broad questions, such as 'Nature, Environment and Society', which are studied from several perspectives.

COMMENTARY: Offering a larger number of coordinated clusters of courses within (and perhaps between programs) might have the advantage of maintaining the decentralized approach to course offerings at SFU. If an additional "bridging" seminar were offered, students could gain the opportunity to discuss issues that span their own disciplines. To take such semesters, students must (a) be granted sufficient flexibility in their electives, (b) be able to count the courses they take toward the requirements of their departments, and/or (c) be willing to take more than 120 credits at SFU. Credentials could be granted for taking such semesters.

D. PROGRAMS

D. 1. Interdisciplinary Departments and Programs

Many SFU departments are interdisciplinary in nature, and SFU offers several interdisciplinary programs. The Department of Humanities offers the "study of a broad range of ideas and subjects drawn from philosophy, art, literature, history, religion, science and social and political thought" (Calendar, p. 156).

D. 2. Bachelor of General Studies

"This non-specialist degree program is designed for students whose educational goals are not met by other, more structured, undergraduate degree programs. Students may complete one or more minors or extended minors (but no major), in any academic area(s) as part of the BGS degree" (Calendar, p. 125).

D. 3. Integrated Studies Programs

"Integrated Studies programs within the bachelor of general studies degree are highly structured cohort based programs designed to meet the educational needs of specific student groups. Such programs integrate liberal studies with knowledge and skills associated with a particular field of practice, or with a background common to its students" (Calendar, p. 125). SFU offers two integrated studies programs: the Liberal and Business Degree Completion Program at Harbour Center and a program in conjunction with the justice institute. A third is being developed in community services.

D. 4. Field Placements

The Faculty of Education and the Department of Earth Sciences have field placements built into their majors.

E. JOINT MAJORS

Most units at SFU have established joint majors, joint honours, and double major and minor programs with other disciplines that enable students to obtain breadth in flexible ways that meet their individual needs. Relative few students in most, but not all, departments take joint majors.

F. NON-CLASSROOM-BASED EXPERIENCES

F. 1. Exchange Programs

SFU has bilateral exchanges with institutions in 27 countries in the world, and unilateral exchanges with many more.

F. 2. Field Schools

Various departments and faculties arrange annual or bi-annual field schools in various countries around the world. A field school is a group of students plus a faculty member who travel to another country for a semester. The students take four or five courses in the foreign country, often traveling and learning about the people and the culture. Field schools often have a specific theme. For example the Ghana field school studies African music and dance.

F. 3. Co-operative Education

In addition to cultivating foundational abilities, co-operative education programs at SFU may cultivate breadth by providing different contexts for students to apply the knowledge and skills they have acquired in the classroom. See Section III C. 6 for a fuller description of SFU's Co-op Program.

G. DISTRIBUTION REQUIREMENTS

SFU does not have a breadth requirement that is applicable to all undergraduate students. Breadth requirements vary considerably across faculties, schools, departments and programs.

G. 1. Faculty of Arts

All students completing an Arts degree must complete 65 credits in Arts subjects. Arts students must obtain 30 credits from no fewer than 5 departments outside their Arts major, with no more than 9 credits from any one department.

G. 2. Faculty of Education

All students who obtain B. Ed. degrees must complete a Certificate in Liberal Arts.

G. 3. Faculty of Business Administration

All students must complete 50 non-Business credits. Fifteen of the 50 credits are specified as a mathematics course, two economics courses and two English/philosophy courses. The remaining 35 credits must be taken from three groups of courses: Group A (languages, history, humanities), Group B (social science courses) and Group C (sciences).

G. 4. Faculty of Science

All students must complete 12 credits outside of Science including 6 credits in the Faculty of Arts. Some individual programs require 3 credits of computing science. These programs require only 9 additional credits outside of Science.

G. 5. Faculty of Applied Sciences

There are no Faculty-wide breadth requirements. Rather, individual schools have their own requirements. The School of Communication requires that 60 credits be chosen from disciplines other than communications. The courses must be chosen from three groups of courses (the groups are similar to the groups in Business). The School of Computing Science requires that students complete at least 9 credits of external breadth courses from more than one department. A list of approved courses is published each year. The School of Engineering Science is very highly prescribed leaving only 6 credits for courses outside of engineering science, mathematics, physics and computing science. The School of Kinesiology partially specifies 6 credits at the lower division; 3 upper division credits are unspecified, in addition to 23 credits of free electives.

G. 6. General Comment

SFU offers students many ways of cultivating breadth, but programs differ significantly in the extent to which they permit, encourage or require students to acquire a solid general education. Some programs prescribe fewer than 60 credits in the discipline, thus leaving students plenty of room to sample courses from other departments. Other departments require a large number of courses in their major and honours programs, leaving students little room to explore topics outside of their disciplines. Some programs require students to take courses specially designed to cultivate foundational abilities and instill breadth; others do not. Few programs encourage or require their students to take sequences of courses, or course clusters, designed to cultivate breadth in a coordinated way.

VI. EVALUATION OF THE WAYS IN WHICH WE HELP STUDENTS ACQUIRE BREADTH AT SFU

A. OPPORTUNITIES

Past SFU committees have recommended increasing opportunities for students to familiarize themselves with the content and modes of inquiry of several areas, by (a) minimizing specialization requirements (PACUP; CPP), (b) increasing opportunities for international experience (CPP; VC), (c) developing new interdisciplinary programs and courses (CPP; VC), (d) increasing opportunities for students to acquire applied and co-operative education experiences (CPP; PCUP; CPP; VC), and (e) establishing university-wide endowed professorships to promote the development of courses that provide access to interdisciplinary ways of understanding the world (VC).

B. REQUIREMENTS

B. 1. Variations Across Departments in Breadth Requirements

Most programs at SFU have distribution requirements, but the number of courses students are required to take outside their majors varies a great deal, ranging from approximately 2-4 in the Schools of Engineering Science, Kinesiology, Computing Science and the Faculty of Science to between 10 and 20 in the School of Communication and Faculties of Business Administration and Arts. Programs also vary in the extent to which they specify courses that count toward their breadth requirements. *The questions raised by such variations are (a) to what extent do they affect the cultivation of breadth in their students, and (b) is this variation warranted by the goals of the programs in question?*

B. 2. Examinations of Transcripts

In an attempt to get a sense of the breadth of exposure to forms of thought and modes of inquiry outside majors obtained by SFU students, we examined the transcripts of a sample of students (coded by number, not name) who graduated from SFU. Although it was relatively easy to evaluate the acquisition of mathematical abilities and exposure to the methods of particular disciplines, it proved much more difficult to evaluate the extent to which the courses listed on transcripts were equipped to cultivate foundational abilities such as writing and critical thinking and to expose students to different forms of thought and modes of inquiry. To do a thorough analysis, one would have to examine the content and structure of the courses the students took, which would entail obtaining syllabi and talking to instructors.

B. 3. Limitations of Unstructured Distribution Requirements

Requiring students to select a specified number of courses from departments other than those in which they are majoring is a limited way of cultivating breadth for the following reasons. First, different departments may offer essentially the same courses—statistics, for example; thus, students may avoid exposure to different modes of thought and forms of inquiry by selecting a narrow range of courses from departments other than their own. Second, although some courses are better equipped than others to cultivate breadth, all courses in a department are treated as equal. Third, open distribution requirements offer students little guidance in combining or sequencing courses in pedagogically meaningful ways.

“The available evidence...suggest[s] that the best outcomes for students are achieved neither by a true core nor by a loose distribution approach, but by distribution requirements involving a carefully structured set of options, i.e., a selection from discrete arrays of coursework” (Jones and Ratcliff, 1998). Some units at SFU (e.g., The Faculty of Education, B. Ed.) employ this approach; most do not. Following an extensive program of research, the Association of American Colleges and Universities concluded that an optimal way for Arts and Sciences programs to structure their majors is to offer sequences of courses that help students learn in a cumulative way: “first to use the field, then to gain

critical perspectives on it, and finally to connect the field's approaches with those of other communities" (Schneider, 1997, p. 253).

B. 4. Conclusions Reached by Previous Committees

Previous committees have raised questions about the structure of breadth requirements at SFU. The Dean of Arts' Ad Hoc Committee (1985) was particularly critical of the practice of requiring students to sample courses from departments classified into groups (called "ABC" requirements by the Committee). On the recommendation of this committee, ABC requirements were dropped in the Faculty of Arts. Arts students were then required to take 30 hours outside their majors in at least four departments. As stated above, Arts students are now required to take 30 credits outside their majors in at least five departments, with no more than nine credit hours in any one department. *Did these changes solve the problem?*

Other SFU committees have recommended requiring students to take breadth courses inside or outside their areas of specialization (PACUP; CPP).

C. STUDENT FEEDBACK

C. 1. Student Evaluations: Survey Data

Data from the *Canadian Undergraduate Survey Consortium: Graduating Students Survey 2000* (see Section III D. 5) revealed that, like students from other Canadian universities, SFU students rated SFU relatively low (C+) on "appreciation of the Arts," "understanding national and global issues," and "moral and ethical development." Engineering Science and Science students rated their programs lower than the mean on "cultivating appreciation of the Arts" and "interpersonal/leadership skills." Arts students rated their programs lower than the mean on "understanding Science." Business students rated their program lower than the mean on "understanding and applying scientific principles" and "appreciation of the Arts."

Business students from SFU responding to *The B.C. University 1999 Two-year Follow-up Survey of 1997 Baccalaureate and PDP Graduates (Office of Analytical Studies)* (see Section III D. 5) gave higher ratings than Arts and Science students on ability to work effectively with others.

C. 2. Student Preferences: Surveys of Undergraduate Opinions

More than 1000 SFU students responded to the *SFU Undergraduate Student Survey—Fall 2000*. With respect to interdisciplinary experiences, more than half of the students rated the following features of the undergraduate curriculum as "very important" or "somewhat important": (a) taking courses in disciplines outside their intended majors (80%), (b) gaining an understanding of the liberal arts and sciences by taking at least one course from each of the faculties (64%), (c) taking courses from several faculty members who come together from different disciplines to integrate the concepts and ideas from their fields of study around a common theme (64%), (d) learning in a setting with students who come from a broad range of disciplines (63%), and (e) participating in a theme-based seminar series incorporating ideas from different disciplines (53%).

Fewer than half the students gave "very important" or "somewhat important" ratings for: (a) learning and studying as part of a cohort...taking the same courses at the same time... (45%), (b) taking an integrated first-year program that contains a core set of courses in the liberal arts and sciences (44%), (c) taking courses with modular components where students from different courses come together for short periods (40%), (d) gaining an understanding of the liberal arts and sciences by taking a predefined set of core courses (33%), and (e) taking a core set of courses in the liberal arts and sciences at an advanced level (i.e., 3rd or 4th year) (21%).

Preliminary results from the Fall 2001 SFU Undergraduate Student Survey revealed the following rank order of "very important" + "somewhat important" ratings (percentages of the sample giving

such ratings in parentheses) for qualities related to a well-rounded undergraduate education: “have an opportunity toward the end of studies to integrate what one has learned in previous courses” (92%), “learn how to use resources available in departments, libraries, and the internet to help gain access to information” (89%), “develop teamwork abilities” (89%), “increase awareness of cultural diversity and international issues” (82%), “increase ethical awareness” (81%), “be exposed to the modes of thought and forms of inquiry in different disciplines” (81%), “develop quantitative, mathematical abilities” (71%), “develop the ability to speak a second language” (44%).

VII. PUTTING IT ALL TOGETHER

A. INTRODUCTION

Canadian universities cultivate foundational skills and breadth by offering students such options as special first year courses, other first year program options, and special degree programs. Some Canadian and American Universities have developed overriding frameworks for curriculum development.

B. FIRST YEAR COURSES AND OTHER PROGRAM OPTIONS

A sense of the range in both the content and structure of options in Canadian universities can be obtained by considering the following programs.

B. 1. The Foundation Year Program at the University of King’s College

Of the Canadian programs we surveyed, the Foundational Year Program at King’s College best exemplifies the “great books” approach. In a single year-long challenging course consisting of lectures and seminars (worth the same as five standard first year courses), some 200 students examine major works of western civilization such as Plato’s *Republic*, Marx and Engels’ *Communist Manifesto* and Eliot’s *The Waste Land*.

B. 2. The Quartet of First-Year Programs Offered at the University of British Columbia: Arts One, Foundations, Science One, and the Coordinated Science Program

The **Arts One Program** is designed to immerse first-year students in significant literary and historical texts that span the centuries. Through a combination of lectures, seminars, and small tutorials, some 200 students in Arts One learn to analyze these texts, formulate arguments, and approach subjects from an interdisciplinary perspective.

The **Foundations Program** promotes interdisciplinary study of broad questions in small seminars. It is particularly attentive to developing thinking, writing, and speaking skills.

The **Science One Program** is a “learning community” consisting of some 70 first-year Science students. In addition to learning the fundamental concepts of first year biology, chemistry, mathematics, and physics, Science One students are required to explore scientific questions in an interdisciplinary fashion. Through group work and writing projects, Science One students are given the opportunity to develop their critical thinking and communication skills.

The **Coordinated Science Program (CSP)** aims to give the same supportive learning and social community found in Science One to a larger number (approximately 200) students, but at the same “academic intensity” as the standard first year science program. CSP students take CSP sections of courses together and attend weekly two-hour CSP workshops where they study specific problems that span several disciplines and learn problem-solving, critical thinking, and communication skills.

B. 3. McMaster University's Theme Schools

“A Theme School is a center of interdisciplinary learning in which a group of faculty members identifies a set of intellectual problems or questions arising out of their research, establishes a programme of study focused on these issues, and gathers a group of students interested in learning about these problems or questions.” Students and faculty form an intellectual community that explores these issues through self-directed learning and independent study. Theme Schools have a lifecycle of five years and accept approximately 80 students for each of the first three years of the School's existence. Completion of a Theme School is equivalent to completing a “minor.”

COMMENTARY: Could we develop Theme Schools at SFU in conjunction with research institutes and centers?

B. 4. The First Year Seminar Courses Offered by the University of Toronto and McGill University

First Year Seminar courses at Toronto and McGill offer opportunities for “entering undergraduates to work closely with an instructor in a class of twenty students” and to be exposed to advanced research methods. First Year Seminar students are “encouraged to develop their ability to think analytically and to express ideas and logical arguments clearly and coherently, both orally and in writing.”

C. SPECIAL DEGREE PROGRAMS

C. 1. McMaster University's Arts and Science Program

This three or four year program serves 60 students who meet in small classes designed to give them substantial work in the disciplines of both the Arts and Sciences, to further the development of communication and critical thinking skills, and to “foster the art of scholarly inquiry into issues of public concern.” It leads to a unique degree: a B. Arts Sc. or a B. Arts Sc. (Honours) . Approximately half the students in this program opt to combine their Arts and Science degrees with a further honours specialization in a discipline of their choice.

C. 2. Carleton University's College of the Humanities

Approximately one hundred students enroll in this four-year program. These students examine some of the most important religious, philosophical, literary, and historical texts produced by both Eastern and Western as well as ancient and modern cultures. The program is structured around a sequence of four year-long core seminars, each focusing on a different topic, time period, and theme: Myth and Symbol; Reason and Revelation; Culture and Imagination; and Science, Language, and Power. Students in this program also take four additional other year-long courses (chosen from a list of approved humanities courses) designed to complement the material presented in the core seminar.

C. 3. The University of Waterloo Faculty of Arts' Honours Applied Studies Co-op Program

This program may be of particular interest to the Simon Fraser community because like SFU, Waterloo is a university that operates on a trimester system. The Waterloo program offers a combination of business and liberal arts courses featuring critical thinking, academic writing, foreign languages, history or politics, and an introduction to humanities, as well as courses in management, introductory economics, computing science, and financial accounting. In general, these courses are completed by the end of the second year, after which students pursue an Honours Arts degree in the field of their choice. From the start, however, each Applied Studies Co-op student spends at least part of each trimester in a

private or public sector Co-op placement. Although Applied Studies Co-op students take somewhat longer than usual to complete their degrees, they graduate unburdened by debt, with an Honours degree and an expanded skills portfolio.

D. OVERRIDING FRAMEWORKS

D. 1. Introduction

A final way in which universities have fostered foundational skills and breadth in their students is by establishing overriding frameworks to guide curriculum development and to structure students' choices. Although the most common framework is a distribution model, the curriculum frameworks developed at the University of Calgary and Duke University deserve special consideration.

D. 2. Distribution Models

At some universities, distribution requirements are structured across fairly well-defined disciplinary categories (e.g., see the National University of Singapore); other universities employ other categories, such as Foundational Skills, Area of Concentration (i.e. major), Integrated Learning and/or Expanded Learning with “x” credits required in such broad areas as the Sciences, the Social Sciences, etc.

D. 3. The University of Calgary Framework

The University of Calgary has directed all undergraduate programs to assist students in the acquisition of the following “core competencies”: (1) critical and creative thinking, (2) analysis of problems, (3) effective oral and written communication, (4) gathering and organizing information, (5) logical calculation, (6) abstract reasoning and its application, (7) insight and intuition in generating knowledge, and (8) interpretive and assessment skills. It has established seven curricular redesign features to guide the revision of all undergraduate programs at the university: (1) a clearly identifiable field of study, (2) a defined interdisciplinary component, (3) an international component, (4) an experiential learning component relevant to program objectives, (5) provision for broad and extended faculty-student interaction at the program level, (6) integration of research, and (7) an explicit program syllabus, which sets out in advance the knowledge and skills to be acquired in a program of study. While departments and programs are asked to redesign their offerings with these competencies and features in mind, units have a great deal of flexibility in how they do it.

Commentary. One strategy for curriculum revision at SFU would involve working with units to develop sets of goals like those developed at Calgary and encouraging units to ensure that their undergraduate programs are designed in ways that optimally enable their students to achieve the goals they have identified. We would be interested in feedback about this possibility.

D. 4. The Duke University Framework

Duke University has structured its curriculum around a matrix based on the following categories: (1) Areas of Knowledge (Arts & Literature, Civilizations, Social Sciences, and Natural Sciences & Mathematics), (2) Modes of Inquiry (Quantitative, Inductive & Deductive Reasoning, and Interpretive & Aesthetic Approaches), (3) Focused Inquiries (Cross Cultural Inquiry, Science, Technology & Society, and Ethical Inquiry), and (4) Competencies (Foreign Language, Writing, and Research). Students are required to take a prescribed number of courses in each of the sub-categories from each major category.

VIII. POSSIBLE WAYS OF IMPROVING THE SFU UNDERGRADUATE CURRICULUM: IDEAS FOR DISCUSSION

A. INTRODUCTION

In this section we sketch a subset of the many ideas we have considered that might improve our general undergraduate program. We feature them here because they seem particularly worthy of further discussion.

B. CULTIVATING FOUNDATIONAL ABILITIES

B. 1. *Should we implement university-wide programs designed to foster communication abilities?*

Although it might reasonably be argued that all professors and all courses already contribute to improving students' writing and reading skills, we have been largely persuaded that enhancing such skills requires particular kinds of help not easily given in normal courses. The crucial element seems to be to ensure that students write a good deal, get frequent and intensive correction of their work, and are encouraged to rewrite and receive further correction.

Possible ways of doing it:

One way of improving the level of reading and writing proficiency of SFU students might be to ensure that they have acquired an acceptable level of proficiency before they are admitted. The main arguments against this idea are (a) the type of writing taught in high school differs in significant ways from the type of writing valued in universities, (b) the costs of adequately assessing proficiency in reading and writing may be prohibitive to students or to universities, (c) adding such admission requirements might discourage students from applying to SFU.

The information we have reviewed suggests that the most promising way to enhance the writing abilities of students is through writing-intensive courses. We could follow what has become a common model, a variant of which is proposed at UBC as a new writing requirement. In the UBC proposal, writing-intensive courses offered in disciplines or by the English Department are marked with a **WI** in the calendar. At SFU, the Writing Centre might play a role in the development of discipline-based writing-intensive courses. In the unabridged electronic version of this paper, we outline a proposal for developing writing-intensive courses at SFU.

The sources we have consulted have not encouraged us to believe that exit examinations assessing writing abilities are particularly effective. Such exams seem redundant if one institutes an effective system within the undergraduate program.

If we implement writing requirements, should they be university-wide, or faculty- or department-based? How many writing-intensive courses should students be required to take? To avoid increasing students' requirements, should departments redesign some of their required courses in writing-intensive ways?

B. 2. *Should we implement university-wide programs designed to foster thinking abilities?*

B. 2. 1. Quantitative Abilities. We can safely assume that students in quantitative fields of study (e.g. most sciences) have sufficient quantitative skills, so requiring students to acquire quantitative skills would largely affect students in the Faculty of Arts.

Possible ways of doing it:

The Faculty of Arts and the School of Communication could require the students they admit to have taken Mathematics 12 or its equivalent.

Following the model used for literacy, departments that conclude that more systematic attention to quantitative reasoning in their discipline would be beneficial could institute courses designated with a **Q** in the catalog. Students could be required to complete successfully one, two, or more of such courses before graduation, as decided by each department. These courses would emphasize the quantitative reasoning appropriate to the departmental discipline.

Quantitative-intensive courses could be a part of the normal set of prerequisites required in a discipline, and be offered in the first two years of a student's program. Alternatively, or additionally, the mathematics department might offer “stand-alone” courses aimed systematically at improving quantitative reasoning. Students might take such courses voluntarily, or, by some mechanism decided by the major department, be required to take them.

B. 2. 2. Critical Thinking Abilities. Faculty from our Department of Philosophy and Faculty of Education have expertise in teaching critical thinking abilities. Roland Case has recommended two initiatives for discussion: (1) departments identify core “critical thinking tools” required in their area and develop procedures for systematically teaching these tools to their students and (2) departments sponsor workshops for instructors to encourage thinking critically about course content and the development of sample resources that support critical thinking within their disciplines.

B. 2. 3. Research Abilities. Past SFU committees have recommended that SFU provide undergraduate students with more opportunities to participate in research conducted by faculty, especially as members of research teams.

B. 3. Should we design programs to develop other foundational abilities?

We considered a set of other foundational abilities whose development might improve the general quality of our undergraduate program. Included in the list were second language, ethical awareness and oral language abilities.

C. CULTIVATING BREADTH

As documented in Section V, the current breadth requirements at SFU are enormously varied from program to program. It is hard to feel confident that they are all successfully meeting the purposes for which they have been designed. Although some form of the present system of requiring students to take courses outside their major areas might, in the end, be preferred, we offer a set of alternative methods that seem worth considering.

C. 1. Should we develop more courses for non-majors, or more courses with an inter-disciplinary, multi-disciplinary, cross-disciplinary, or special focus?

Many undergraduate courses at SFU are specifically designed as introductory courses for disciplinary majors or, if more advanced, they require such introductory courses as prerequisites. This often makes it difficult for an undergraduate from one discipline to be exposed in a serious but non-professional way to the modes of thought and enquiry in other non-related disciplines. One way to allay this problem is to promote a palette of rigorous but specifically non-professional courses whose purpose would be to provide exposure and experience for students outside the often-narrow confines of their disciplinary major requirements. Resources could be earmarked for this purpose, and guidelines or an approval mechanism could be developed. Courses in this category might be jointly taught by faculty from different departments and even different faculties, exposing students to the characteristically distinct approaches/cultures of different disciplinary areas. To the extent that such courses could attract students from different disciplines, they might provide opportunities for group work among students of different disciplinary backgrounds. Writing or quantitative reasoning might explicitly be made part of some of these courses (see B.1. and B.2. above).

Other issues that would have to be addressed: *Would such courses be aimed at a particular level (first year, third year)? Would such courses be off limits for students in closely related disciplines? If not, would non-specialist*

students be at a disadvantage with respect to grades? What impact would design, development and participation in such courses have on faculty teaching loads?

C. 2. Should we develop more "A for B" courses?

A related idea would involve providing a set of courses whose general character might be caught by labels such as: Literature for Scientists; Science for Educators; History for Creative Artists; Social Sciences for Computer Scientists, etc. The purpose of these courses would be to introduce students in particular disciplines to the problems and methods of other disciplines, perhaps by dealing with specific topics, such as the development of science in 19th century England or the influence of African art on modern iconography.

C. 3. Should we encourage the development of portfolios?

Instead of taking a particular range of out-of-major courses, students might be encouraged in their first year to select a general topic such as the geology of the solar system or hunter-gatherer societies that they explore and elaborate over the time of their degree. Students could take courses in a variety of departments. Assistance in setting up portfolios, choosing a topic, etc., and criteria for their assessment would need to be developed, and this would have implications for resources devoted to student advising. A set of templates or models might be provided to incoming students, guiding but not inhibiting unduly their construction of a portfolio.

C. 4. Should we offer alternate grading options?

One barrier to students attaining "breadth" by taking courses outside their disciplinary specialties is the fear of competing with students majoring in the departments in which the courses are offered. The fear is that grades received in such courses will lower the GPAs of the non-majors and jeopardize scholarship support and admission to graduate or professional schools. One way of dealing with this problem is for the major department to identify courses that are part of the major program and for SFU to compute GPAs separately for "major" and "other" courses. If SFU scholarship aid were awarded on the basis of the "major" courses only, then no student would need to fear loss of scholarship because of lower-than-acceptable performance in "other" courses that might supply needed breadth. A potential benefit of this procedure is that graduate schools and employers would have a more sensitive measure of student performance, which might give an edge to SFU students. Another way of dealing with the problem is to grade non-major courses on a Pass/D/Fail system.

C. 5. Should we develop more Certificate programs?

We might consider implementing programs based on SFU's program leading to a Certificate in Liberal Arts, perhaps expanded to include other mixes of courses. Certificates could be associated with regular degree programs and identified on students' records, thus enhancing students' attractiveness to employers or graduate schools. Different faculties or departments might use a common set of lists but with different distribution requirements (e.g., science courses might be available to Arts students obtaining a Certificate, but not to Science students). A variant of this idea would be to introduce a variety of "mini-certificates" in different areas. The 30-hour requirement for a Certificate in Liberal Arts would, however, be difficult to meet in existing major programs that are highly prescribed.

D. PUTTING IT ALL TOGETHER

D. 1. Should we make changes in our breadth requirements?

University-Wide Breadth Requirement? *Should we institute a general, university-wide breadth requirement?* Advantages could be that SFU students would acquire a broader education and the SFU undergraduate degree would acquire a new meaning. On the negative side, all present programs would have to be examined for compatibility with the requirement and modified accordingly. Problems also

would arise with respect to granting credit to transfer students who have taken a significant portion of their lower division courses elsewhere.

If we were to develop university-wide lists of courses designed to enable student to meet a breadth requirement, we would have to decide how to structure the lists, how to decide what courses qualify for inclusion, and how many courses to require. Such requirements would presumably differ somewhat from faculty to faculty, department to department, and/or program to program. A balance would have to be struck between a too-rigid set of requirements that would not fit the needs of individual units and an overly flexible set that could render the program meaningless or lead to perceptions of unequal treatment.

Faculty or Department breadth requirements? At present, there is considerable diversity from department to department. *Should we employ models for cultivating breadth other than the distribution models employed in most programs?*

D. 2. *Should we develop cohort general programs?*

Adapting some of the models we examined to SFU would involve large-scale revisions of traditional course-accumulation systems. We have included links to some of the more prominent programs we examined in the electronic version of this paper. Below, we briefly consider three of the models we considered particularly promising.

D. 2.1. *Should we develop cohort programs?*

Following models employed by many universities, we might develop cohort programs that provide a distinctive set of courses for incoming students; either for all such students or a significant proportion of them (e.g. UBC's Arts One and Science One programs). Alternatively, we might develop more particular cohort programs within individual units or areas, such as the one developed by Mark Winston.

A significant obstacle to the development of large-scale cohort programs, and to the proposal in D.2.2. below, is the relatively large number of transfer students accepted by SFU and the tendency of many students to attend SFU part-time and sporadically.

D. 2.2. *Should we develop distinctive semesters?*

As an aspect of the proposal outlined below in D.2.3, the 5th semester of students' programs, or as close to the 5th semester as is convenient, could involve taking a set of courses within their major designed to provide students with a general orientation to their discipline and its place in the wider intellectual world. A number of SFU programs currently offer single courses that have this character.

D. 2.3. *Should we develop more comprehensive programs?*

We have looked at a variety of large-scale, comprehensive programs (see electronic version of this paper). The aim of these programs is to help high school students make the transition from forms of thought that are common in high school to those that are appropriate to higher education. We sketch one version of such a program below.

Semester 1: Students would be assigned to cohorts of approximately 15 students. The cohorts would take programs in each of the following four topics:

Making sense

How have people made sense of their experience and of the world?

- | Oral cultures and the cognitive implications of literacy. Rational forms of inquiry. Inquiry into the past, and its purposes. Modern sciences and limits of sense they offer. The arts; their earliest forms and purposes. What kind of sense is made in music, painting, poetry, and the novel?

The human mind

Brain and Mind. Archeology of brain development, and apparent implications. Oddities of the human brain. Nature of mind—social, epistemological, psychological, psycho-social organ?

Human cultures

The range of human cultures across time and place; variability and constraints. Close look at a distinctive and “exotic” culture (Canada?). Forms of religious experience. The cultural nature of humans.

The cosmos

Developing understanding of the cosmos through history. Contemporary understanding. Bases of our current understanding, and their reliability.

Semester 5: Described in D. 2.2. above.

References

- Bailin, S. (2001). Critical thinking and Science Education. *Science and Education*, 1-15.
- Gaff, J. G. Ratcliff, J. L., & Associates (1997). *Handbook of the undergraduate curriculum: A comprehensive guide to purposes, structures, practices, and change*. San Francisco: Jossey-Bass.
- Gaff, J. G. & Wasescha, A. (1991). Assessing the reform of general education. *Journal of General Education*, (40), 51-68.
- Jones, E. A., et al. (1994). *A plan for validating criteria and measures to monitor progress toward national education Goal 5: Identifying college graduates' essential skills in writing, speech and listening, and critical thinking*. University Park Pa.
- Jones, E. A. & Ratcliff, J. L. (1991). Which general education curriculum is better: core curriculum or the distributional requirement? *Journal of General Education*, 40, 69-101.
- Kanter, S. L., Gamson, Z. F. & London, H. B. (1997). *Revitalizing general education in a time of scarcity: A navigational chart for administrators and faculty, pp. 126-127*. Boston: Allyn and Bacon.
- Nelson, M. (Ed.). (2000). *Alive at the Core: Exemplary approaches to general education in the humanities*. San Francisco: Jossey-Bass.
- Romer, R. (1995). *Making quality count in undergraduate education: A report for the ECS Chairman's "Quality Counts" Agenda in higher education*. Denver Educational Commission of the States.
- Schneider, C. G. (1997). The arts and sciences major. In Gaff, J. G. & Ratcliff, J. L. (Eds.). *Handbook of the undergraduate curriculum, pp. 235-261*. San Francisco: Jossey-Bass.