Introduction

The 2002-2005 CBU Strategic Plan identified expanded research as a key element in the development of the institution. It also provided specific objectives, principles, and tasks instrumental to the fostering of research, innovation, and scholarly work. Today, CBU's research record is impressive, especially for an undergraduate institution. In a Research Infosource Inc. assessment released in the Globe and Mail (Nov. 5, 2002), CBU ranked 39th among all Canadian post-secondary institutions in total government and non-government research funds received and 25th in total research funds per full-time faculty member. East of Quebec, CBU ranked 5th in total research funds received and 2nd in total research funds per faculty member.

Objectives

A major objective of the CBU Strategic Plan is to develop a framework appropriate to expanding research, while giving consideration to strategic research initiatives, essential networks and partnerships, industry relationships, commercialization structures and processes, fundamental links, funding, and mechanisms to secure necessary support. For the near future, one of CBU's major goals is to be recognized and respected regionally, nationally, and internationally as an emerging university with substantial research expertise and productivity.

Current Research Thrusts

To enhance research and scholarly productivity, CBU has chosen several areas of strength and potential on which to focus institutional development initiatives. For many of these the University has already established collaborations with researchers, industry, and community partners. The following are flexible, multifaceted, and interdisciplinary areas, which afford abundant individual and collaborative research opportunities for present and future faculty members:

a) Economic and Technological Development and Innovation
b) Environment, Natural History, and Biodiversity
c) Pure Science & Mathematics
d) Determinants of Health
e) Culture and Heritage
f) Social and Political Process and Change
g) Educational Resources Research and Development

a) Economic and Technological Development and Innovation

Community Economic Development. There is a long and productive history of community economic development research at CBU, and various institutes and resources have been established to facilitate such inquiry. For example, the Community Economic Development Institute promotes, encourages, and supports community economic development research and initiatives within a participatory framework, and has established a national and international presence through a network of research associates. The Small and Medium-Sized Enterprise Institute provides a base from which research into small and medium-sized businesses can be undertaken. The Marketing Research Centre offers research and business services to the regional communications, financial, manufacturing,

retail, service, and tourism sectors. The Centre for Housing Initiatives carries out research on housing issues and initiatives, with special attention to Cape Breton. CBU also offers an MBA in Community Economic Development.

Information Technology Innovation. CBU has been designated a Centre of Excellence for Information Technology by the Nova Scotia government and has established the Information Technology Innovation Centre (ITIC) in partnership with the National Research Council (NRC), InNOVAcorp, and IT industry partners. The expert NRC research group at CBU is engaged in leading edge IT research and development. The focus is on design issues related to anytime-anywhere access to wired and wireless networking systems and includes networking research, software research, software engineering, and wireless systems research. A primary focus of the NRC's Wireless Systems Laboratory located at CBU is the development of low power and low cost wireless communication modules that can be integrated with sensors and microprocessors for use in a wide variety of contexts. The ITIC's state-of-the-art Applied Microelectronics Laboratory focuses on embedded intelligence devices, embedded systems software development, embedded operating systems, embedded device networking and communications, ASIC and FPGA development computing systems, and telecommunications. CBU also has received funding from the Canadian Foundation for Innovation to engage in collaborative research and development. The Chair IT will work collaboratively with the NRC unit at CBU and provide ongoing liaison between the NRC research effort and the IT research activities conducted by other CBU members. In addition, several federally funded CBU mathematicians are complementing these research and development thrusts by working on new formulae and techniques intended for application in software development.

Offshore Petroleum. In response to the initial phases of the development of the region's offshore petroleum industry, CBU created the Centre of Excellence in Petroleum Development. The Centre is involved in research, development, and commercialization activities with industry partners and other educational institutions, and has developed specialized laboratories in process operations, control systems, fluid dynamics, and measurement and computer simulations.

b) Environment, Natural History, and Biodiversity

Localized Environmental Assessment and Restoration. CBU is investigating the establishment of a Centre for Environmental Research in recognition of the growing significance of the international environment industry. The Centre will conduct interdisciplinary pure and applied research addressing localized environmental challenges, with a special emphasis on Cape Breton and the Atlantic region.

Natural History and Biodiversity of Cape Breton. A number of researchers at CBU conduct studies in a variety of areas including biodiversity monitoring, biomass production of beech and fir saplings, insect systematics, parasitology, organismal biodiversity, environmental physiology, landscape analysis, conservation and molecular biology of plant DNA, secondary metabolism in plants, biochemical diversity of flora, fungal metabolite distribution, Agreen crab infestation, stream ecology, fish habitat assessment, long term

effects of seismic energy on the lobster fishery, local distribution of phytoalexins, local plant pathology, and the development of tyrosinase inhibitors and other medicinal agents from the plants and animals of Cape Breton.

c) Pure Science and Mathematics

In addition to the research conducted in the areas of environment, natural history, and biodiversity, several faculty members in the School of Science and Technology are engaged in basic or pure research in chemistry, biology, and mathematics. This basic research is the foundation for much of Canada's innovation. For example, CFI New Opportunities award winner, Dr. Carl Hickman is a mathematician who, by many standards, practices 'pure' science. Yet, his research has implications for the information technology sector. Likewise, one of our biologists has an active research program in plant molecular biology, especially in regard to oat seed proteins and endocytosis-related plant proteins. This 'pure' research has significant application in the field of health.

d) Determinants of Health

CBU has embraced the population health approach as a focus for research and already has made several steps to enhance the health research climate. Individual researchers have obtained funding for health-related research projects from NSHRF, CFI, NSERC, and CBU's internal research fund. These developments are complemented by the establishment of a joint St. Francis Xavier/CBU Bachelor of Nursing program, the existence and growth of the Cape Breton Wellness Centre, and the research experience and expertise of faculty in a variety of disciplines such as biology, chemistry, psychology, sociology, anthropology, political science, mathematics, and communication.

Sociocultural Determinants. Sociocultural determinants refers to the entire range of social and cultural forces outside the individual that are in some manner related to health status. Research fitting this category is multi- and cross-disciplinary involving several fields of study.

Psychological/Psychosocial Determinants. Psychological/psychosocial determinants refers to the full range of psychological factors related to health status, as well as to those determinants that involve both psychological and social factors. Research interests include: ergonomic and source credibility factors in health information web sites; personality, early pinnacles in career achievement, and shorter individual life spans; and conscientiousness, health status, and longevity.

Behavioural Determinants. Behavioural determinants refers to behavioural and lifestyle factors related to health status. Examples of current research interests in this area are: recreational hockey and cardiovascular risk; resistance to the dominant weight loss paradigm; tobacco product labelling requirements; and gambling addiction.

Material Determinants. Material determinants refers to physical, matter-based, external agents with the capacity to influence health status in a positive or negative way. Research interests include: screening and synthesis of tyrosinase inhibitors; potential effects of evening primrose, borage, blackcurrant, and fungal oils on human health; a flax oil trial in Type II diabetics; toxic environments and adolescent well being; coumarins, the bioactive structures with antifungal property; and local environmental factors and reproductive health.

e) Culture and Heritage

There is research strength in the area of culture and heritage at CBU. Three subareas stand out because of their strong focus, sizable core of investigators, and collaborative, interdisciplinary nature.

Cape Breton History and Culture. Founded by a community with a unique heritage and distinct culture, and mandated by statute to emphasize partnerships with the local people, cultures, and communities, CBU has developed a special interest in the formal study of Cape Breton history and culture. Research interests include: Cape Breton history; Cape Breton cooperativism and vernacular architecture; labour history; industrial heritage; Cape Breton military history; naming patterns in Cape Breton; museum studies; decline and survival of the Gaelic language in Cape Breton; role of women in the socioeconomic development of Cape Breton; history of the Cape Breton psychiatric institution; historic hotels in Cape Breton; history of employment in Cape Breton; Jewish women in Cape Breton; coal mining humour; Cape Breton Celtic music; history of the Fortress of Louisbourg; Cape Breton heritage houses; studies of Cape Breton women; the centre-periphery dialectic in Cape Breton; policy and consciousness in Mi'kmaq life; Cape Breton's labour image; Cape Breton English; the settlement of Cape Breton; the use of nicknames in Cape Breton; cultural studies of Cape Breton; the process of documenting Mi'kmaq experience in a Mi'kmaq voice; Sydney and the Atlantic wars; company housing in Cape Breton; and a dictionary of Cape Breton English.

Scientific and Nonscientific Perspectives: Interface and Integration. In the past five years, federally funded CBU biologists have pioneered the development of Integrative Science and packaged the option as an innovative concentration within CBU's four-year BScCS degree. This new area in post-secondary science enables students to explore both the commonalities and the differences that exist between scientific and aboriginal knowledge and has strong potential for global significance. The importance of Integrative Science has been recognized by the Canada Research Chairs Secretariat, which recently awarded a Tier I Canada Research Chair to the approach's founder, Dr. Cheryl Bartlett, Professor of Biology. The approach is being adapted to more specialized areas such as health sciences, environmental studies, and natural resource management.

Values, Morals, and Ethics. A number of faculty members from different disciplines such as philosophy, religious studies, economics, and psychology are involved in the study of values, morals, and ethics. Their current research interests include: literature and values; science, technology, and values; world-views and values; the shaping of science by historical and pragmatic values; the meaning of historicity; values and choice in career

decision making; moral psychology; moral education; environmental ethics; biomedical ethics; ethico-economics; self-esteem; aesthetics; spirituality and health; death and dying; love, sex, and friendship; theories of happiness and pleasure; and the philosophy of law

f) Social and Political Process and Change

Faculty members in the disciplines of sociology, anthropology, political science, public administration, psychology, economics, communications, history, and philosophy have research interests in various aspects of social and political process and change.

Rights, Responsibilities, and Canadian Public Policy. The internationally recognized Children's Rights Centre at CBU conducts research on children's rights, monitors the implementation of the United Nations Convention on the Rights of the Child, and reports to the U.N. and the Canadian Coalition for the Rights of Children on the progress of Nova Scotia and Canada in this regard. Contributions from the Centre have focused on: the challenge of children's rights for Canada; cultural socialization and conceptions of war and peace; youth justice reform and the rights of the child; children's rights education at the university level; public policy on fetal protection; reducing violence through children's rights education; adolescent labour in depressed areas of Canada; cross-national comparison of adolescent's attitudes toward international conflict; children's rights in hard times; children's rights education as a means toward combating racism in Canada; public funding and implementation of human rights programs in Canada; and international perspectives on children's rights. Faculty members from several different disciplines also have research interests that fall into this category, including: law, society and human rights; public policy and public administration; peacekeeping and peacemaking policy; and public policy and non-profit organizations.

Language and Interpersonal Communication. Faculty members in psychology, linguistics, and communications at CBU have research interests in the dynamics of language and interpersonal communication. Recent studies have focused on: motivation, anxiety, and emotion in second language acquisition; the influence of personality and willingness to communicate on the acquisition of French vocabulary; facing the fears associated with professional speaking; a model of willingness to communicate in a second language; the development of measures, competence, and audience congeniality and their relation to public speaking anxiety; the role of gender and immersion in communication and second language orientations; contrastive analysis and the teaching of E.S.L. to Mi'kmaq students; biases in self-ratings of second language proficiency; and a competency based training model of personal, professional, and public communication

g) Educational Resource Research and Development

Faculty at CBU have already generated a fair degree of scholarly activity in this category and their interests cover a broad spectrum: computer applications in post-secondary course and program delivery; educational CD ROMs; training manuals and workbooks; test item banks; teacher's resource manuals; archival document digitization; development of videographic databases; electronic learning; issues in distance

education; the WebCT Platform; children's rights education curriculum; occupational choice brochures; instructor's manuals; virtual learning/process-based learning and synchronous internet delivery; critical thinking courseware; learning needs of faculty moving toward online course delivery; development of business case studies; and reviews and evaluations of educational resources.

Issues of Gender

CBU is an equal opportunities/affirmative action employer. CBU encourages recruitment from qualified Aboriginal People, African Canadians or other persons from a visible minority group, persons with disabilities, and women. The first Tier 1 Chair secured at CBU is filled by a female.

Allocation of Chairs

CBU has implemented a successful nomination for the Tier 1 allocation to in 2002. Of the remaining Chairs, one Tier 2 will be filled within the field of Information Technology. The remaining two Tier 2 Chairs are to be determined

Tier 1	Tier 2	Source	Research Thrust
2002		SSHRC	Integrative Science (Female, internal nomination)
	2003	Special	Information Technology (External recruitment)
	(2) 2003	Special	Thrusts to be determined

Expected Observable Outcomes for Assessing Success

CBU will continue to review our research strengths on a regular basis based on a number of outcomes:

- External research support (research contracts and grants received)
- Collaborations (with other universities, the private sector, government, and NGOs, etc.)
- Publications (refereed journal articles, books, conference presentations, reports, and electronic publications)
- Student participation (number of CBU student researchers who pursue advanced education; number of master's, graduate, and post-doctoral researchers attracted)
- Community involvement (faculty involvement in the school system, community lectures, relevant involvement in local organizations)

The CRC in Integrative Science has achieved observable outcomes in three areas of the stated research objectives. To date they have submitted a major proposal to CIHR-IAPH, developed ecosystem stewardship with the Bras d'Or Lakes Watershed, and formed a partnership with the Mi'kmawey Debert Cultural Centre, a Paleo-Indian site.

The Process of Allocation and Strategic Research Planning Process

The revised plan was developed by the Research and Academic Institutes Policy Committee of Academic Council and subsequently approved by the Academic Council.