

School of Pharmacy

2012 Academic Program Review





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List of Acronyms

AFPC	Association of Faculties of Pharmacy of Canada
AV	Audiovisual
CAPSI	Canadian Pharmacy Students and Interns
CCAPP	The Canadian Council for the Accreditation of Pharmacy Programs
CEQ	Course Evaluation Questionnaire
CIHR	Canadian Institutes of Health Research
CPDC	Curriculum Planning and Development Committee
DI	Drug Information
DIC	Drug Information Centre
ELPD	Entry Level Pharm D
FTE	Full time Equivalent
HSC	Health Sciences Centre
MAP	Manager of Academic Programs
MUPS	Memorial University Pharmacy Society
NAPRA	National Association of Pharmacy Regulatory Authorities
NSERC	Natural Sciences and Engineering Research Council
ORS/OCP	Office of Research Services/Office of Collaborations and Partnerships
OSCE	Objective Structure Clinical Evaluation
PANL	Pharmacists' Association of Newfoundland and Labrador
PEBC	Pharmacy Examining Board of Canada
PI	Primary Investigator
SAO	Senior Administrative Officer
SOP	School of Pharmacy
SPC	Strategic Planning Committee
SPE	Structured Practice Experience
TA	Teaching Assistant
TC	Tiffany Court



Executive Summary

The SOP was established in 1986 and graduated its first class in 1990. Since that time there has been steady growth of the undergraduate program and the development of a small but strong graduate program. Changes in the pharmacy profession, primarily involving an expanded scope of practice, have been the main drivers for the continual review and change in how schools of pharmacy across the country structure curriculum. The school strives to meet evolving professional and societal needs. In 2009 the provincial government recognized the need for more pharmacy graduates and provided funding for the school to build its capacity in terms of faculty, staff and enrolment. Expansion efforts have been hampered by a lack of suitable, physical space. If the school is to overcome this challenge it will need the continued collaboration and support of the university, provincial government and other key stakeholders.

The Canadian Council for the Accreditation of Pharmacy Programs (CCAPP) is responsible for the accreditation of professional undergraduate degree programs in pharmacy at Canadian universities. Following its last review CCAPP awarded the SOP full accreditation status in recognition of the high quality of its program. To ensure continued success and relevance of the program the SOP has initiated a curricular assessment strategy.

While Memorial's SOP is one of the smallest in the country it is working to increase its research capacity and graduate programming. The addition of a grants facilitator position coupled with an increased faculty complement will bring exciting growth in these areas in the coming years.

The SOP undergoes significant review: an Academic Program Review conducted in 2002; accreditation review every 6 years; review of strategic direction annually. These reviews can be daunting for a small unit and should be streamlined to facilitate more efficient use of resources. Faculty and staff of the SOP are committed to its students and to the university. The following pages are a self-assessment of this commitment.

Introduction

In May 2012 the School was advised that an Academic Program Review was to be undertaken. As much of the preparation of documentation would have to be done over the summer months and into the busy fall semester the faculty and staff agreed that it would be best for a small working group to prepare the initial draft. The working group was comprised of the Dean, Associate Deans and the Senior Administrative Officer. As part of the process the self-assessment document submitted in 2009 to the CCAPP was reviewed and updated by the respective faculty who chaired working groups during that process. Faculty and staff provided information and direction as needed as the draft was being developed. The final draft was submitted to faculty, staff and students in January 2013 for review and feedback was incorporated into the document.

In January 2013 the student body also had opportunity to review and provide feedback on the self-assessment document as part of the Academic Program Review. This was facilitated through the class representatives.

Historical Perspective of the Program

The SOP was established in 1986 and graduated its first class in 1990. In 2011-12 the school celebrated its 25th anniversary and during that time has seen substantive changes to the undergraduate program and the development of a small but strong graduate program.

In the early years the school was challenged with recruiting and retaining qualified faculty which resulted in considerable variability in the delivery of the program. However, the school is now relatively well resourced with respect to faculty and staff. In early 2009 the provincial government announced operational funding to support expansion of the undergraduate program. Additional faculty and staff were hired but enrolment was not increased because of the lack of suitable infrastructure to accommodate the expansion. Due to a lack of available office space, faculty and staff currently are housed in two different locations - one site at the Health Sciences Centre (HSC) and the other off-campus at Tiffany Court (TC). Faculty and staff are disconnected from each other and from the students as a result. An insufficient number of lecture theatres, aging and inadequate research space, no social space for students and no small group learning spaces impedes the SOP's to teaching and learning strategies.

The program was initially structured to consist of one pre-requisite year and four pharmacy years (1+4). In 1991 this was revised to two pre-requisite years and three pharmacy years. As a result of a 2001 CCAPP accreditation recommendation the program reverted to a 1+4 structure in 2004. At that time a comprehensive educational outcomes-based curriculum was developed based upon educational outcomes established by the Association of Faculties of Pharmacy of Canada (AFPC). Since then, continuous review and evaluation of the curriculum has been undertaken and modifications introduced as necessary. In 2010-11 substantial revisions to the curriculum were approved and the resulting new program was introduced in September 2011.

The M.Sc. program was introduced in 1991 and a Ph.D. program in 1999. In addition to mandatory graduate seminars, the SOP currently has 15 graduate courses consisting of six regular courses and nine special topics courses, with a view to expanding the offering as the faculty complement increases.

The SOP's research activities are in harmony with MUN's overall strategic research plan. The primary focus of research within the SOP relates to the strategic research theme of *Wellbeing, Health and Biomedical Discovery*. The school's contribution is in several areas including: (a) research related to therapeutic drug monitoring, aging, interdisciplinary research on efficient and accessible health care systems and effective drug-related public health programs and policies, (b) biomedical sciences ranging from cellular and molecular processes to animal and cell modeling that respond to the province's high incidence of diseases such as cardiovascular diseases and neurotrauma, (c) drug discovery and development in the areas of cancer and infectious diseases, (d) childhood obesity, infant feeding, vitamin D and pharmacoepidemiology.

Strategic Objectives

The school has been guided by a strategic plan since the mid-1990s. The strategic plan is reviewed and updated on a regular basis as are the vision and mission statements. This plan functions as a guiding document for the SOP and supports the strategic direction of the university. Both the SOP's vision and mission reflect that espoused by Memorial University:

Vision

Working together towards a healthy tomorrow

Become...the future of pharmacy

Mission

As a School of Pharmacy with a strong sense of community, we are dedicated to:

- Expanding the School of Pharmacy and developing the school as a centre of excellence for comprehensive pharmacy studies
- Preparing pharmacy professionals committed to collaborative patient-centred care
- Fostering excellence and innovation in research and graduate studies
- Advancing the scope of pharmacy practice
- Building upon a learning environment in which every student is valued.

We believe our mission statement sets the overall framework for our strategic plan and the achievement of our stated goals, objectives and activities breathe life into the mission.

The SOP's strategic plan supports that of the university especially in terms of students, research, and the needs of the people of our province. To highlight, the SOP boasts an approximate 99 percent retention rate of students in the program since its establishment. This is a direct result of the care and dedication of our faculty and staff who work closely with students, in particular those who encounter personal or academic challenges.

The school's curriculum is reflective of Memorial's Teaching and Learning Framework. The SOP works collaboratively to provide a learning environment that is conducive to real life practice, engages learners, and is supportive, outcomes-oriented, inclusive and responsive. The program is structured to facilitate the practical integration of knowledge derived from all courses within a semester and also builds on previous learning by having students complete challenges that become increasingly complex as they progress through the program. Students participate in standardized scenarios reflective of real-life practice experiences. Standardized patients are utilized routinely and student performance during these patient interactions is assessed with the use of audiovisual (AV) capture technology. This permits both instructors and students to view performance, devise improvements and gauge progress.

There is tremendous diversity in nature of the activities and as students progress there is increasing complexity of the tasks they are required to complete. Much of this work is facilitated through the pharmacy skills course stream. Introduced during the 2004 curricular revision, the skills courses are scheduled in all but the final semester and help students integrate the various courses within a semester

and allow them to see and demonstrate the practical application of knowledge. The successful delivery of each skills course requires tremendous commitment and coordination from all teaching faculty and staff within each semester. In the final semester of the program students embark upon a 12 week structured practice experience during which they become members of health care teams and contribute to the care of patients. During the final semester, students are charged with the responsibility of performing as professional pharmacists, with guidance from preceptors. It is the culmination of all the learning that precedes it over the curriculum.

While the school has never had difficulty in attracting applicants to its undergraduate or graduate programs (approximately 300 applications are received per year for the undergraduate program and 70 to 100 for the graduate program) there has been a recognition that we need to attract students who possess the values and attitudes that are recognised as being desirable in a pharmacy health professional. In 2011 a new strategy was developed around recruitment of students for the undergraduate program. Brochures and posters for display in high schools were developed which outlined information about the pharmacy program as well as the desirable attributes, interests and skills for a career in pharmacy. Information on graduate studies is provided as a link on the website of the School of Graduate Studies and is updated each year. In addition, up-to-date information on the research activities and interests of faculty members is listed on the SOP's website.

Memorials' vision of growth in research is also being fostered in the SOP. It recognizes the importance of research and has hired a grants facilitator to support faculty in a variety of ways. In particular, the grants facilitator assists in proposal development and associated protocols ensuring not only a strong submission but effective use of resources in the process. It is hoped that this will not only increase the number of successful submissions but help to foster greater levels of cooperation, collaboration and engagement across disciplines, across campuses, and with other institutions as well as grow a strong research culture. It is hoped that an expansion of the SOP will bring new and emerging areas of research.

All clinical faculty in the SOP have cross appointments with Eastern Health and/or the Faculty of Medicine and have established practice sites that allow them to engage in direct patient care, improve the health outcomes of patients, serve as role models to students, and contribute to the education of other healthcare practitioners. Our Structured Practice Experiences (SPEs) allow us to engage our

professional community as we recruit practising pharmacists to serve as preceptors for our students. Service as a preceptor requires they make a commitment to the student, the school, their profession and to a culture of lifelong learning.

While the current strategic plan is for five years it is reviewed and updated annually. The strategic plan was developed with consideration of the AFPC educational outcomes, the Blueprint for Pharmacy, the National Association of Pharmacy Regulatory Authorities (NAPRA) Competencies for practice and CCAPP Baccalaureate Standards so as to ensure that the goals are linked to current standards of pharmacy practice. As a dynamic document it serves to guide and support the School as it continues to grow and progress. The development and review of a strong strategic plan takes time and effort. The faculty and staff continue to commit that time and effort as they see the value of the plan and are committed to achieving its goals and objectives.

The complete Strategic Plan (2009-2014) including goals, objectives and action plans is included in Appendix 1. Although the plan had been near completion during Winter 2009, revisions became necessary after the school received notice in late spring 2009 that the provincial government had approved funding to expand the undergraduate program by 20 seats per academic year. Accordingly, the SOP modified the strategic plan to include plans for this expansion.

Strategic Planning Process

The faculty has engaged in a systematic planning process and the resulting strategic plan facilitates the achievement of the faculty's mission, goals and objectives. This committee has the responsibility for drafting strategic plan statements and ensuring that the current strategic plan is reviewed and updated on an annual basis. The strategic planning process occurs regularly, involves all faculty and staff, and has provided for broadly-based input from practitioners, provincial regulatory authorities, and other key stakeholders and communities of interest such as other health professional faculties. The process has taken into consideration societal and professional changes as well as the academic pharmacy environment in Canada.

The 2005-2009 plan was reviewed and supported by the Provost and Vice-President (Academic). In 2009 a high level strategic plan was crafted by an external consultant based on a faculty-staff retreat and stakeholder discussion. The current 2009-2014 Strategic Plan has also been reviewed and supported by

the Provost and Vice-President (Academic).

The 2009-2014 Strategic Plan has proven to be a valuable guide to the administration and committees of the SOP. It has guided activities and decision making and has helped facilitate:

- Increased integration and coordination between courses;
- The implementation of additional learning strategies;
- The development of more OSCE-type teaching methods and evaluation;
- The implementation of curriculum assessment and revision strategies
- Strengthened interprofessional approaches to education and research;
- The inclusion and development of more community-based clinical practice sites for advanced practice experiences;
- Earlier student exposure to clinical practice ;
- New faculty and staff recruitment.

In summary, major initiatives at the SOP are driven by its vision, mission and corresponding goals and objectives. The strategic plan serves to meld the expectations of the profession with those of the university. The environment in the school and the university fosters collaboration and communication between faculty and staff, students, health professionals and the community. We are committed to our vision "Working together for a healthy tomorrow...become the future of pharmacy".

Strategic Planning Committee

The SOP has a Strategic Planning Committee (SPC) composed of four faculty members (two from Pharmacy Practice and two from Pharmaceutical Sciences), the SPE program coordinator, and the Dean (ex-officio). The SPC reports to the Academic Council of the school. The role of the SPC includes the development of strategic planning retreats and workshops, drafting and revising goals and objectives and monitoring progress made by the school with respect to meeting the vision, mission, goals and objectives as stated in the strategic plan. Evaluation of performance relating to the strategic plan is part of the monitoring function of the SPC. In particular, the action timelines relating to various goals and objectives are regularly updated and continuing issues identified and highlighted.

Ongoing development of the academic program, curriculum and instructional strategies is the purview of the Curriculum Planning and Development Committee (CPDC).

Self-Assessment and Accreditation

Since 2001, the school has undertaken three self-assessment reviews for accreditation (2001, 2003 and 2008) and one academic program review (2002), in addition to this current review. The 2009 self-study document prepared for CCAPP accreditation is presented in Appendix 2 and provides a detailed and comprehensive report of the state of the program at that time, its progress since the accreditation review in 2003 and opportunities for the future. The last two accreditation reviews have resulted in the highest accreditation award possible (full status for six years). This is a reflection of the commitment of the faculty and staff to respond to the deficiencies noted in the 2001 review, including curriculum redesign as introduced in the fall of 2004, and to their ongoing commitment to curriculum review and revision.

The most consistent finding of all these reviews is that the school's growth and progress is being severely hampered by the lack of appropriate physical space. This must be addressed if the school is going to continue to deliver a program that produces pharmacy graduates who are well prepared to meet the expectations of the profession. Expansion of the program as supported by government will not occur until the lack of suitable space for expansion is addressed.

Student Enrolment /Program Outcomes

Undergraduate Enrolment

The current enrolment in the undergraduate program is 158 (1st year: 40, 2nd year: 43, 3rd year: 37, 4th year: 38), all of whom are full-time students. When the school was established in 1986, 30 students were admitted but only 25 graduated (several left the program for other areas of study). The number of students admitted has grown over the years and peaked at 41 students in 1998 but was reduced to 36 in 2000 because of the limited availability of final year clinical placements. In 2004 the new outcomes-based curriculum was implemented and while 40 students were admitted in total, 20 entered the final offering of the 2+3 program and 20 entered the new 1+4 program. This was done to avoid a year in which there were no graduates from the program as there was a shortage of pharmacists. Since that time admissions have been maintained at 40 per year. Given the current space, 40 is the maximum number of students the program can comfortably accommodate and still allow space for the occasional student who may be held back for academic or personal reasons.

The SOP continues to have a substantial number of applicants to its undergraduate program with a stable acceptance rate at approximately 14 to 15 per cent as outlined in Table 1. The number of applicants from Newfoundland and Labrador versus out of province candidates is also provided.

Table 1: Applicant Admissions Rates

Year of Application	Total Number of Applicants (NL/Non-NL)	Percentage of applicants admitted
2012	253 (116/137)	15.8%
2011	285 (109/76)	14%
2010	281 (112/169)	14.2%
2009	256 (97/159)	15.6%
2008	284 (99/185)	14.1%
2007	335 (126/209)	11.9%

Academic Preparedness and Assessment of Students for Admission - Undergraduate

The academic quality of the students admitted to the undergraduate program has been consistently high. Initially students were selected based on academic performance alone. In 2003 the admission process changed to incorporate a written assessment and a behavioural interview of candidates. As a result, candidates would now be considered for admission based on academic and non-academic attributes. This change was initiated in response to the pharmacy community's suggestion that certain non-academic attributes were also important. A psychometric consultant was engaged and best options to assess non-academic attributes were explored. A focus group was held to identify desirable characteristics of pharmacy graduates (validated by a random survey of the community) and it was decided that behavioural interviews and a written assessment would be introduced to the admissions process as a means to assess the desirable attributes of a graduate.

While candidates are still selected for interview on the basis of academics alone, an admission score based on a 65% weighting of academic performance and a 35% weighting on non-academic attributes as determined via interview is now used to select candidates for admission. As part of our commitment to continuous review and improvement of our procedures, this year the Admissions Committee has begun a process to re-validate the non-academic criteria, to assess the appropriateness of the 65/35 split between academics and non-academics and to determine if it would be rational to use academics as the

basis for offering an interview and to use non-academic criteria only for the final selection of candidates for admission.

Approximately 25 per cent of the applicants admitted to the program hold an undergraduate degree. In terms of gender there is a predominance of females to males. Applicants to the SOP continue to be of high quality. The minimum calculated admission scores (65% academic score + 35% non-academic score) over the last seven years are summarized in Table 2.

Table 2: Minimum Academic and Calculated Admission Score

Year of Admission	Minimum Academic Score	Minimum Admission Score (combined academic & non-academic scores)
2012	74.5	73.1
2011	74.3	72.9
2010	74.0	72.1
2009	75.1	71.9
2008	75.0	72.6
2007	75.5	72.3
2006	75.1	72.8

While only one pre-pharmacy year is required to be admitted to the program, many of our students have completed more than one year and some have completed undergraduate degrees when they begin the program. A few have also completed graduate degrees prior to admission. Table 3 provides a breakdown by admission year.

Table 3: Number and Percentage of students admitted with undergraduate degrees

Year of Admission	Number of Students Admitted	Number of Students with Undergraduate Degrees	Percentage of Applicants
2012	40	10	25
2011	40	14	35
2010	40	10	25
2009	40	6	15
2008	40	5	12.5
2007	40	10	25
2006	40	6	15

For more details on this as well as other achievements for 2011-2012 please see the SOP's Annual Report in Appendix 3.

Program Outcomes

Table 4: Success Rate of Graduates on PEBC Examination

Year of Graduation	Number Writing	Number passing Part I written	Number passing part II OSCE	Overall Number Passing
2012	40	38	39	37
2011	41	36	39	35
2010	40	36	40	36
2009	37	36	36	35
2008	17	17	17	17
2007	20	20	19	19

There is some concern that the SOP's overall ranking on the written component (Part I) is low compared to other schools across the country but the overall difference in the mean scores among the schools is quite small. We have attempted to determine if there are specific subject areas in which our students are less successful on the written component as a means to identify areas of the curriculum that could be strengthened but the statistics provided by PEBC are not of much value. For the past few years the school has ranked first or second with respect to performance on the OSCE component of the exam. The improvement in the average score ranking of the OSCE component is the result of the intensive pharmacy skills curriculum in the program.

Graduate Student Success

In the past few years we have had stability in the graduate program and have seen both M.Sc. and PhD students progressing through their programs and successfully graduating. Graduate students are encouraged to publish actively and to present research findings at conferences.

On average, M.Sc. graduates publish one to two peer-reviewed papers and PhD graduates publish three to six peer-reviewed research papers and review articles. Pharmacy graduate students have been active in disseminating their research accomplishments by presenting them as posters in national and international conferences. Two award winning posters include the poster entitled "Lipid-Based formulation of Taxol for optimizing its apoptotic effect in breast cancer" by Zheyu Wang that won the Gattefossé Canada/CSPS Award in Lipid-Based Drug Delivery award, and a poster entitled "Design,

Synthesis, and Evaluation of Quinolone-Based Anti- cancer Agents” by Abeer Ahmed at the 22nd International Congress of Heterocyclic Chemistry in 2009 that earned second place among posters presented by graduate students and post-doctoral fellows at that conference.

Curriculum and Teaching

Overview

The School of Pharmacy offers one undergraduate program leading to the degree of Bachelor of Science in Pharmacy. It utilizes a five year program framework consisting of one pre-pharmacy year and four years of pharmacy. A program overview is presented in Appendix 4. This program is based on the AFPC Educational Outcomes for Baccalaureate Pharmacy Programs. The program places a strong emphasis on practical-based learning with two course streams (Pharmacy Skills and Structured Practice Experiences) which allow students the opportunity to apply classroom theory to simulated and/or real life practice opportunities and learn the skills necessary to be effective pharmacists.

Undergraduate Program

The Curriculum Planning and Development Committee (CPDC) is responsible for overseeing the planning, development, review and evaluation of the curriculum on an ongoing basis. The committee consists of four faculty members from the School of Pharmacy (with representation from different disciplines within the School), a student representative and an alumnus. The Dean and Chair of the Committee on Undergraduate Studies serve as ex-officio members. Recommendations made by the CPDC are forwarded to the school’s Committee on Undergraduate Studies as appropriate, then to Academic Council, next the Senate Committee on Undergraduate Studies, and finally to Senate for approval.

In 2004 the school embarked upon a major curricular change, updating and revising its program of study for the undergraduate degree. At that time a new educational outcomes-based curriculum, guided by the Association of Faculties of Pharmacy of Canada (AFPC) document “Educational outcomes for Baccalaureate Pharmacy Graduates in Canada” was developed. The resulting program was a challenging one, averaging seven courses and 19 credit hours per semester.

Since 2004 the school has been involved in several initiatives designed to evaluate the success of the program. Program evaluations undertaken by the CPDC suggested a need to streamline the program

further by eliminating redundancies, reducing overall workload and ensuring better sequencing of courses. Consequently in the Fall of 2011, the school introduced its first substantive curricular changes since 2004. In 2011 the SOP adopted the 2010 educational outcomes for the first professional degree program in pharmacy.

While these changes increased the overall credit hours required for the degree by two credit hours from 174 to 176, they significantly decreased student workload as four courses were removed from the program. No additional content was added, rather the credit hours in the pharmacy skills courses were increased to recognise the substantial effort required by students.

While the SOP does not have departments, the program can be defined by a number of distinct streams or areas.

Pharmaceutical Sciences

Courses in the pharmaceutical and biomedical sciences form the foundation of the curriculum, with each academic year providing pre-requisite knowledge, upon which courses in the subsequent years depend. The courses comprising this aspect of the program provide students with the theory, knowledge and laboratory experiences necessary for practice-based components of the curriculum. They also provide exposure to aspects of pharmacy which students may not have otherwise considered as possible career opportunities, such as laboratory research. Overall, the primary role of courses within the biomedical and pharmaceutical sciences is that of contributing to general educational outcomes for a university graduate relating to knowledge, thinking and planning abilities and self-directed learning. Some of these courses address the professional educational outcomes including the role of the pharmacist as a care provider, advocate, communicator, manager, etc.

The required biomedical courses include anatomy and physiology, biochemistry, microbiology, pathophysiology, and immunology. Major objectives of these courses are to provide students with a solid understanding of human health and disease states. With the exception of Anatomy and Physiology, these courses are taught by members of the Faculties of Medicine and Science who have specific expertise in these subject areas. Many of these courses are taught in the first two years of the pharmacy curriculum and are prerequisites for pharmaceutical sciences courses, but some are taught

simultaneously when the fundamental concepts of the material would aid in students' understanding of specific pharmaceutical sciences material.

The timing and depth of the pharmaceutical sciences courses are designed to support and aid the pharmacy practice curriculum. These course topics are meant to provide the basis for understanding the medicines used in maintaining health and treating disease states and include pharmaceutics, pharmacology, medicinal chemistry, toxicology, pharmacokinetics, pharmaceutical biotechnology, and pharmaceutical analysis. While the majority of these courses are taught in the second year, a few are offered in the first and third year of the program. Full-time faculty members within the SOP are responsible for teaching these courses, with the exception of the first of two pharmacology courses, which is taught by members in both the SOP and the Faculty of Medicine.

Pharmacy Practice

Course streams in the areas of pharmacy practice, patient care and therapeutics focus on ensuring that the AFPC educational outcomes are met through an integrated approach to learning. General educational outcomes pertaining to knowledge and thinking abilities, planning, value and ethical principles and self-directed learning are addressed through these courses. Additionally, professional outcomes such as those of care provider, communicator, collaborator, manager, advocate, scholar, and professional are also addressed. Students are required to integrate the knowledge of previously studied material such as pathophysiology, pharmacology and pharmacokinetics in the management of the disease states discussed. All of these courses prepare students for structured practice experiences (SPE) in which students are challenged to further expand their knowledge and ultimately demonstrate the practical application of this knowledge within clinical settings to provide direct patient care.

Social/Administrative Pharmacy

Curriculum offerings in the area of behavioural, social and administrative pharmacy are present throughout all four years of the program. There are four courses in pharmacy research and evaluation (PRE) that are offered throughout the curriculum which discuss health policy, pharmacoepidemiology, critical appraisal and evidenced based clinical practice. Courses in health ethics and business administration are also offered. Specific outcomes relating to care provider, communicator, collaborator, manager, advocate, scholar, and professional are addressed through these course

offerings. The material covered in these courses is linked to the pharmacy skills courses and the SPE experiences in which students are expected to apply knowledge gained to practice situations.

Pharmacy Skills

The pharmacy skills stream ensures development of the knowledge, skills and attitudes necessary for our graduates to be effective pharmaceutical care practitioners. This stream of courses broadly addresses all the educational outcomes (i.e. care provider, communicator, collaborator, manager, advocate, scholar, professional) and targets more specific educational outcome elements that are contained within each of these outcomes that are required of entry-to-practice level graduates.

The pharmacy skills stream integrates material from the didactic courses in a manner that helps students develop an understanding of the interrelationships of the basic and applied subject areas. Students are evaluated on their ability to integrate subject matter from different areas and apply it to practice situations. The courses evolve over the four years of the program so that initial student exposure to simple tasks requiring minimal integration gradually evolves into complex assignments which rely on knowledge, skills and attitudes developed in both current and previous years.

The nature of assignments and assessment tools vary based on the skill being assessed. Courses also have a large self-directed learning component. Formal presentations, interviewing/educating standardized patients, dispensing prescriptions, performing pharmaceutical calculations, searching literature for drug information, practicing physical assessment skills, and developing pharmaceutical care plans are large components of the skills courses. Professionalism is a significant focus of these courses and students are continuously evaluated on their professional conduct when engaged in any activity throughout the pharmacy skills courses. In all skills courses, failure to achieve the minimum requirement for performance of predetermined tasks results in students being retested until the required level is accomplished.

Throughout the delivery of the skills courses, students are evaluated and activities are adjusted to meet the needs of the students. The skills instructors receive both informal and formal feedback on the course and make any appropriate adjustments. The skills group also meet regularly to discuss student progress and to make sure the intended educational outcomes are being met and the skills required to attain

them are being taught in a consistent and increasingly complex fashion. See Appendix 5 for an overview of Skills program content in each year.

Structured Practice Experience Program

The Structured Practice Experience (SPE) Program is an integral component of the course of study leading to the Bachelor of Science in Pharmacy degree at Memorial University.

Under the direct supervision of pharmacist preceptors, students have the opportunity to apply their university-attained knowledge and training to deal with patients and practice situations in order to achieve proficiency and competency in performing the functions of a pharmacist.

The purpose of the SPE Program is to have students *observe* and *practice* the skills necessary to become a pharmacist. It is intended to bridge the gap between the academic study of pharmacy and the practice of pharmacy. The SPE Program includes practice experiences throughout the program and a sustained practice experience during the final year as follows:

- Four weeks in a community pharmacy at the end of the winter semester in the first year of the pharmacy program (Pharmacy 201W);
- Four weeks in an institutional setting at the end of the winter semester in the second year of the pharmacy program (Pharmacy 302W);
- Four weeks in a community pharmacy at the end of the winter semester in the third year of the pharmacy program (Pharmacy 403W);
- Twelve weeks in clinical practice during the winter semester of the final year of the pharmacy program (Pharmacy 500X).

The SPE Program provides opportunities throughout the undergraduate program for students to demonstrate the practical application of knowledge, skills and attitudes in the provision of patient care in multiple practice settings. The proposed increase in enrolment will challenge the SOP with recruiting new sites and qualified preceptors, particularly for final year practice experiences.

Preceptors, Sites and Supports

Many dedicated pharmacists volunteer their time and share their knowledge and experience by serving as preceptors in the program. Preceptors and sites must meet specific criteria to participate in the SPE Program. See Appendix 6 for a list of these criteria.

Two preceptor orientation/education programs, each approximately three hours in length and designed to be delivered in a face-to-face setting, have been developed for pharmacists in an effort to better prepare and support them in the teaching of our pharmacy students. These are:

- *Introduction to SPE Program* (2003; modified in 2007): in addition to providing an overview of the SPE Program, includes tips for the preceptor on providing feedback and evaluation.
- *Pharmaceutical Care* (2008): describes the patient care process taught at the School, including patient assessment and the pharmaceutical care approach for identifying and managing drug-related problems.

These have been offered as part of the continuing education program at the annual Pharmacists' Association of NL (PANL) Annual Conference regularly since 2007 as well as at the SOP and other venues periodically since 2003.

Future plans include the development of on-line module(s) for preceptor education to provide pharmacists with more convenient access to such programs.

Assessment of Students

Since SPE rotations are academic courses, they must be successfully completed for promotion or graduation. Student evaluation is based on: preceptor's assessment of student performance; attendance; written assignments or presentations; workbook audits or examination on material learned during the SPE period.

Preceptors play a vital role in assessing student's proficiency and competency in the practice environment. Student evaluation forms are required to be completed in full by preceptors and submitted to the SPE Coordinator at the end of the SPE. The student evaluation form was updated in 2012 to reflect the AFPC's most recent educational outcomes document. Students are required to

demonstrate specific knowledge, skills and behaviours as described on the form in order to meet the competencies required of Canadian pharmacists at an entry-to-practice level.

In addition to student assessment, the following aspects of the SPE Program are also assessed:

- **Preceptor & Site** (by student)
- **SPE Program** (by student)
- **SPE Program** (by preceptor)

Constructive feedback from preceptors and students is appreciated and used to further develop and enhance the SPE Program.

Challenges and Changes in the SPE Program

The school has always been challenged with finding adequate numbers of suitable placements for SPE IV students within the regional health authorities because of the lack of well-developed clinical practices. Additionally there are no clinical residency programs which would provide mentorship and supervision opportunities for students in the SPE IV. As a result, the primary responsibility for student supervision in SPE IV rests with the clinical faculty and places a tremendous burden on them. With the recent approval of entry level PharmD in Ontario it can be anticipated that the school will have to seriously consider moving in this direction in order not to disadvantage its graduates. This, coupled with the desire to expand enrolment, will place an even greater if not an impossible burden on clinical faculty for clinical supervision of students.

As part of the curriculum which was introduced in 2004, it was agreed that it would be important to have a required hospital SPE experience prior to the final year. This was done so that students could see the potential career opportunities of an institutional setting. As a result, a four week hospital based SPE after second year was incorporated into the curriculum. However, the experiences of students have been variable. Additionally, since students complete a course in self-care in the winter semester of the second year, they wanted to have a community based experience to apply their learning in this area. Changes to the SPE after the second year to two weeks of hospital based practice and two weeks of community practice are being considered.

Interprofessional Teaching and Learning

In September 1999 the Deans and then Directors of Medicine, Nursing, Pharmacy and Social Work along with the Dean of Education established the Centre for Collaborative Health Professional Education. It was created in response to:

- A growing emphasis on interdisciplinary health care and the need for interprofessional health education programs
- The requirement of professional accrediting bodies for rigorous educational evaluation
- The need to incorporate and evaluate educational innovations such as computer-based and distance education, problem-based learning and simulated patients
- Recognition that research activities centred on education is a legitimate and valuable academic focus

The centre's mission is to initiate, facilitate and coordinate activities to enhance the education of health professionals as collaborating members of the healthcare team. It is overseen by a governing council composed of the Deans of Medicine, Education, Nursing, Pharmacy, Social Work, Human Kinetics and Recreation and the Director of the Counselling Centre. The current chair is the Dean of Pharmacy. In addition, support staff helps to oversee the daily operations and implement and evaluate its programs.

Faculty and students in the SOP have participated in a variety of interprofessional modules/learning blocks which are incorporated into various courses throughout the four years of the program. The topics/modules which are covered include:

- Health promotion/illness/disease prevention
- Newborn Care
- Collaborative Mental Health Practice
- Professionalism in Interprofessional Teamwork
- HIV/AIDS Care
- Geriatric Care
- Patient Safety

More details regarding the centre and its many collaborations and research initiatives are provided in the CCAPP Self-Assessment document in Appendix 3.

Innovation in Teaching and Learning

Innovation in teaching and learning is occurring in many courses throughout the pharmacy curriculum but is perhaps most frequent and best evidenced in the Pharmacy Skills course stream. With constant evolution and changes in practice, there is a continual need for innovation in the delivery of these courses. Not only is new material being incorporated on an annual basis but new approaches as to how best to deliver that material are constantly utilized in order to ensure the most effective teaching and learning environment for our students. Our state-of-the-art professional practice lab provides the opportunity for students to audio and video record their performance not only for formal assessment but to guide and assist them in self and peer evaluation. A number of innovative strategies are incorporated into pharmacy skills including:

- Think-Pair-Share: Students are divided into groups, they review a case (think), then they are combined with another group who reviewed the same case to discuss (pair) and finally the larger group presents the case to the others (share).
- Professionalism Small Group discussions: Pharmacists discuss issues around professionalism with students in small group settings.
- Apothecary Hall visit: Students visit Apothecary Hall to receive orientation to the Pharmacy Board and to gain exposure and appreciation for the history of pharmacy within Newfoundland and Labrador.
- OSCEs and role-plays are incorporated throughout the skills courses, for clinical and practice based scenarios and management situations.
- Communication Skills tests: Students' written and verbal communication skills are assessed through regular formal testing.

Other innovative approaches which are incorporated into the didactic courses include:

- Self-directed learning: students must successfully complete a series of continuing education activities about the role of natural health products in the clinical management of disease.
- The incorporation of active learning strategies into the classroom which require students to complete pre-readings and/or assignments and then come to class prepared to actively participate in case-based discussions rather than sit through didactic-lecture style formats.
- Abstinence contracts: As part of the curriculum on substance abuse and dependence students are required to sign an abstinence contract and give up something for a week they were "addicted" to (e.g. caffeine, cigarettes, Facebook). Each day the class members review their

struggles to maintain sobriety. At the end of the abstinence period a more thorough discussion is held in which issues such as relapse, triggers for relapse and sobriety coping strategies are reviewed. A discussion on whether there were changes in the students' views on addiction and staying sober took place.

- Clicker technology has been introduced in some courses for greater interaction during classes. This technology is often combined with a popular teaching strategy that employs a "Jeopardy" game format to engage and assess student learning.
- In medicinal chemistry an interactive teaching/learning approaching the form of Team Projects and In-Class Open-Book quizzes are utilized. This encourages students to share their viewpoints with classmates and apply a knowledge-based approach in selecting appropriate drugs for potential patients.
- Case-based discussion during tutorials, including paper cases and simulated patients (to gather a history) are utilized routinely in many courses
- Student focused reviews: As a pre-exam review strategy students are assigned a specific learning objective for a particular subject area or topic and are tasked to develop two multiple choice questions to test that objective. The submitted questions then form the basis of an in-class review session. This allows the instructor to assess student learning and correct misunderstandings or misconceptions prior to the exam and also serves as a study review and self-assessment strategy for students.

Congruence of Curriculum with Goals and Preparedness of Students for Careers

The principal focus of the SOP is to prepare students to enter the pharmacy profession as licensed pharmacists. We do this by providing a high quality education and experiential learning program. This is in keeping with the mission and goals of the school.

When the curriculum was developed initially in the late eighties and revised in the nineties, educational outcomes for pharmacy programs were not defined. Therefore, the curriculum adhered to the normal curriculum content for North American Schools of Pharmacy and included all the components recommended by the *Commissions to Implement Changes in Pharmaceutical Education (AACP, March 1991)*. Once the Association of Faculties of pharmacy of Canada (AFPC) adopted the Educational Outcomes (EOs) for a Baccalaureate Pharmacy Graduate in Canada (AFPC -1998), the school held a retreat to review and discuss the implications of adopting them. However it was not until 2002-03 when

a zero-based approach to designing the curriculum was undertaken, that the curriculum was truly based on the AFPC educational outcomes. Since then new EOs have been developed and in 2011 a retreat was held to review the most recent educational outcomes (*AFPC Educational Outcomes for Entry-to-Practice Pharmacy Programs in Canada, 2010*) and to align the curriculum and the evaluation and assessment strategies for students with them.

Students are made aware of the EOs through different avenues. During orientation, new students in the program are provided with an orientation manual which lists the expected outcomes upon graduation. These are reviewed during the orientation session and students are advised of the outcomes-based structure of the curriculum. As students progress through the program, course outlines, lecture and laboratory and pharmacy skills and experiential learning materials consistently refer to the EOs. Additionally, many of the evaluation tools to assess student performance are based on the EOs.

We believe the pharmacy program at MUN meets its goal of graduating individuals who possess the knowledge, attitudes and skills to enter pharmacy in a variety of different practice settings and meet the needs of patients and employers.

Program Evaluation

The SOP regularly seeks input from its students and graduates to gauge not only general satisfaction but to ensure that the program is meeting students' and the profession's needs. For many years now the Centre for Institutional Analysis and Planning has conducted focus groups with each class year at the end of the academic year to receive input from students. Additionally post-graduation surveys of recent graduates have been conducted to assess their preparedness for practice. Appendix 7 presents the survey results for the class of 2010 as a sample of how feedback is sought. This survey was further revised in 2012 to reflect changes in the educational outcomes. Survey feedback combined with regulatory and practice changes influence modifications in undergraduate programming such as the recent curriculum change.

The SOP has developed a detailed plan for program evaluation which is being overseen by a post-doctoral fellow with an expertise in curriculum assessment. It is a multi-pronged plan that will look at aligning curriculum with assessment, reviewing student evaluations, implementing techniques that will

better meet pedagogical needs, reviewing student achievement and conducting relevant research in the area. The plan is included in Appendix 8.

Graduate Program

Graduate Enrolment

The SOP offers M.Sc. and PhD programs in Pharmaceutics and Medicinal Chemistry/Pharmacognosy, in addition to M.Sc. programs in Neuropharmacology, Cardiovascular Pharmacology/Pharmacokinetic-Pharmacodynamics, Targeted Drug Delivery, Therapeutic Drug Monitoring, Pharmacoepidemiology, and Pharmacy Practice.

Applications for graduate studies at the SOP are reviewed twice a year for admission in the fall and winter semesters. On average, 200-250 inquiries are received by the SOP for graduate studies for each session, of which 35-50 applications from eligible applicants will be reviewed in detail for each intake.

Until 2010, the SOP followed SGS and MUN's minimum requirements for admission to its graduate programs - a BSc degree in pharmacy or science related fields, a GPA over 2.5 or cumulative average of 65% or second class. Due to the increasing number of applications from highly qualified applicants, as of the Fall 2011 semester the requirements have been raised to a minimum GPA of 3.0 or cumulative average of 70%. An overview of the graduate application process is presented in Appendix 9.

Since 2002, 23 students have been enrolled in the M.Sc. and PhD programs, of which ten students graduated with M.Sc. degrees and three with PhD degrees. Three students were terminated or required to withdraw either due to health problems or unsatisfactory performance and three withdrew. Others are still completing their programs.

The SOP plans to increase the enrolment for graduate students and Table 5 outlines its projections. These projections will be contingent on appropriate space being available

Table 5: Graduate Enrolment Projections

Year	2011-2012	2014	2016	2018	2020
# of students enrolled or projected	8 2 PhD 6 MSc	13 3 PhD 10 MSc	19 7 PhD 12 MSc	23 9 PhD 14 MSc	26 10 PhD 16 MSc
# of faculty supervising	2	7	7	9	10

The graduate program has experienced some challenges over the years. On the downside there has been a loss of some faculty members, insufficient/inappropriate research space and inadequate research grants. However, on a positive note there has been the addition of faculty in pharmaceutical sciences/pharmacology and social-administration, establishment of a new research website, graduation of three PhD and ten M.Sc. students, attraction of research funding from national funding agencies and pharmaceutical/nutraceutical companies alongside dissemination of research activities in the forms of patents, peer-reviewed articles and professional engagement with other health-related organizations that have improved the image of our school as a research-oriented unit.

Congruence of Graduate Curriculum with Departmental Goals

During 2002-2007 most graduate students at the SOP were in Medicinal Chemistry, Targeted Drug Delivery, and Pharmaceutics. The addition of new faculty members in Pharmaceutical Sciences/Pharmacology and Social-Administrative Pharmacy has expanded our graduate program to the following five areas:

- Medicinal Chemistry/drug design and discovery of new molecules with anti-cancer or anti-infective properties;
- Pharmacology/Mechanisms of Toxicity and Protection in Neurons;
- Pharmacology-Pharmacokinetics/Mechanism of Cellular Failure in Autoimmune Diseases;
- Therapeutic Drug Monitoring;
- Pharmacoepidemiology

Pharmaceutics is no longer an area of graduate research due to the lack of funding and engagement of faculty in this area.

Currently there are six regular graduate courses and nine Special Topic courses within the SOP. The course content, instruction method, and marking system of Special Topics are based on the recommendation of the relevant supervisory committee, and the research requirements for each individual student. There are special courses in other units available to our graduate students which complement their program. In addition to the courses, students attend graduate seminars, lab meetings and journal clubs.

Accomplishments and Shortcomings

Since the last APR, our graduate program has gone through many changes. Changes in faculty and faculty engagement have affected productivity in recruiting/training new graduate students. Another major hurdle has been the limitation of research space including labs and office space. Nonetheless we have graduated a number of students in both the M.Sc. and PhD programs. Recruitment of faculty to replace those who left in addition to the recent addition of faculty members in Social-Administrative Pharmacy and Medicinal Chemistry bodes well for the future recruitment and education of graduate students.

Projected enrolments to 2016 are based on the capacity of current facilities and available faculty. From 2017 onward, projections are based on increasing the number of faculty members, expansion of space (both labs and offices), increased research funding and new equipment. The projected numbers will not be able to be accommodated if these conditions are not improved.

Research

The SOP is informally divided into three disciplines: Pharmacy Practice, Social- Administrative Pharmacy, and Pharmaceutical Sciences. A general description of each research stream follows, with examples of ongoing research projects.

Pharmacy Practice: Faculty members in the Pharmacy Practice stream teach undergraduate pharmacy students and supervise them during their experiential learning placements. Most of these faculty members also maintain a clinical practice and are involved in direct patient care. They also serve from time-to-time as preceptors for pharmacists who are completing out-of-province, post-graduate rotations in clinical pharmacy as a requirement of their Residency and/or Pharm D programs. Research programs are generally small as they tend to be restricted to the summer semester. A number of faculty

members have consistently obtained funding, and many have expressed a desire to expand their research capabilities. Research in this stream focuses primarily on the role of the pharmacist within the healthcare system. Projects include: interprofessional health education, pharmacists' scope of practice, physician education, polypharmacy, electronic health records, and expansion of mental health and addictions services for youth.

Social-Administrative Pharmacy: Faculty members in the Social-Administration stream teach, supervise graduate students, and have budding research programs. Social administration is an area of pharmacy concerned with the practicalities of service organization and delivery, including formation and implementation of policies. Research projects include: obesity and bariatric surgery, breastfeeding, vitamin D, the use and effects of drugs in large populations, and health systems and health policy research.

Pharmaceutical Sciences: Faculty members in the Pharmaceutical Sciences stream supervise graduate students, teach undergraduate and graduate students, and operate laboratories where their research is performed. This discipline studies drug design and discovery and the effects of the drugs on biological systems. Researchers have a strong track record in securing and retaining external research funding. Projects include neuropharmacology and physiology of brain trauma; anti-cancer and anti-fungal drug discovery, targeted delivery, and cardiovascular pharmacology and pharmacokinetics.

Research activities at the SOP fall in the following categories: (1) research performed by graduate students as a partial fulfillment for M.Sc. or PhD degrees; (2) research performed by undergraduate students during undergraduate summer research programs sponsored by funding agencies, SOP, or supervisors' grants; (3) collaborative research with other researchers within Memorial University, Canadian and foreign universities/research centres, and pharmaceutical industries. The results of these endeavours have been disseminated in the form of peer-reviewed/non peer-reviewed papers, patents, conference posters or oral presentations.

Faculty members at the SOP have been successful in securing over \$2.5 million in research funding and over \$3.5 million in infrastructure/operating funding (as co-investigators) since 2002. See Appendix 10 for a complete listing of funding. The school also has access to funding for undergraduate students to participate in summer research projects with faculty. The number of students participating each year is

variable depending on the number of faculty available to supervise. Funding comes from different sources such as CIHR, NSERC, SOP (through a Primary Health Care grant from community and industry sponsors), and supervisors' grants.

In spite of its small size, the faculty members at the SOP conduct collaborative research with a number of other academic units at Memorial University including the Faculty of Medicine, School of Nursing, and the Departments of Chemistry, Biochemistry, and Psychology in the Faculty of Science.

The SOP is located in the Health Sciences Centre (HSC), which also houses the Faculty of Medicine, the School of Nursing, the Health Sciences Library, Animal Care Services, and the General Hospital. The HSC is attached to the Janeway Child Health and Rehabilitation Centre. Such an integrated complex, unique in Canada, provides easy access to necessary facilities and faculty expertise for graduate studies in the SOP. Appendix 11 is a brief report prepared by the Health Sciences Library staff regarding its pharmacy specific holdings.

Collaboration and assistance from the Cancer Research Group and Terry Fox Cancer Research Lab, Neuropharmacology, Cardiovascular Pharmacology/Physiology Group, Molecular and Immunological Virology Group, Community Health Group of the Faculty of Medicine and several research groups at the School of Nursing have been proven to be very effective.

Research Performance

Tables 7 and 8 present research funding and the presentations/publications of findings from 2007 to 2011.

Table 7: Grants and Research Contract Funding 2007-2011

Type	Number
Tri-Council Grants	8
Non Tri-Council Grants	31
Contracts and other Non-Peer reviewed funding	10

Table 8: Publications and Presentations 2007 -2011

Details	Number
Peer Reviewed Publications	64
Non Peer Reviewed Publications	30
Abstracts for Oral/Poster Presentations	99
Invited Speaker Presentations:	32
Conference Attendance	38
Public (lay) Presentations	3

Evaluation of research performance of the faculty members of all disciplines at the SOP is done by considering the following activities:

- Funding Indicators to assess performance can include:
 - Grants as PI or co-investigator
 - Combined value of all grants
 - Value per FTE
- Publications/Citations. Indicators to assess performance can include:
 - Peer-reviewed journal articles
 - Other peer-reviewed publications (e.g. book chapters)
 - Non-traditional publications (reports, product monographs, etc.)
- Participation in Review Panels for Peer-Reviewed Grants
- Abstracts for Oral/Poster Presentations
- Invited Speaker Presentations
- Lay Presentations
- Engagement in Policy-making Bodies
- Patents
- Industry, Community, or Other External Project Partners
- Student Supervision(graduate and summer Research students)

Research Support

In order to assist faculty members in identifying funding opportunities and submit high quality grant applications, the SOP recruited a grants facilitator in late 2011. This position is responsible for:

- Identifying federal, provincial or local research funding opportunities relevant to SOP researchers

- Providing an overview of future funding opportunities and deadlines, research administration workshops, and seminars
- Providing explanations of university policy and agency guidelines, institutional sign-off, application review and regulations
- Liaising with federal, provincial, and other university departments and granting organizations with regards to grant application policies and procedures
- Developing potential multidisciplinary collaborative research initiatives with other universities, research centres, and jurisdictions
- Participation in research team meetings
- Formulating and organizing applications for research opportunities
- Providing leadership, guidance, and direction in the development, writing, and submission of grant proposals for funding
- Reviewing (including proofreading and editing) research grant applications
- Targeting the application to the mandate of the relevant granting agency
- Recording, assessing, evaluating the research performance of the SOP
- Promoting the researchers and research of the SOP

Since the position has been established the incumbent has made great strides in providing assistance, guidance, information, and advice to researchers during the granting process; assisting in grant preparation and the submission of 17 grants, including preparation of forms and templates, and extensive editing of documents; and has made key contacts within Office of Research/Office of Collaboration and Partnerships (ORS/OCP) and other internal and external groups who have direct or indirect implications for SOP research.

Research and Teaching

Good teachers need to be good scholars and active researchers. For our graduate courses it would be difficult to envision a situation where research is not intimately tied to teaching. Undergraduate courses including therapeutics, pharmaceuticals, pharmacology, pharmacokinetics, pharmacy social-administration related courses, and medicinal chemistry are directly related to the latest research in the areas of drug discovery, development, delivery, therapeutic applications and monitoring, and patient care. Scholars/researchers are more aware of current trends in areas of specialization and have the potential to provide a more stimulating learning environment for students.

Interdisciplinary projects in which the clinical faculty are involved provide opportunities for research into collaborative health professional education. In the past few years our clinical faculty members have been involved in Interdisciplinary Problem-based Small Group Teaching for Medicine, Pharmacy, Nursing, and Social Work students.

Awards

Undergraduate

The SOP has many awards available to students in all four years of the program. These awards are sponsored by individuals, groups, organizations, and pharmaceutical companies, all of which are strong supporters of the school.

The SOP offers approximately 47 different types of awards to undergraduate pharmacy students, which recognized 64 students for their accomplishments in 2012. There are three ways that students are recognized:

- 1) **Scholarship:** A scholarship is based on academic performance and is awarded to the student with the highest average meeting the conditions of the scholarship. Scholarship standing is required for all scholarships.
- 2) **Bursary:** A bursary is based primarily on financial need. The SOP recognizes that many of our students incur financial debt in order to complete their studies.
- 3) **Award:** An award is offered to recognize special achievements or to assist with special projects or travel. Approximately half of our scholarships/awards are based on student involvement in activities outside the classroom.

In September of each year the SOP holds an awards night where students are officially recognized for their achievements.

Graduate

The SOP has received a number of research awards and recognitions. These awards/recognitions have been categorized as

- Major awards/recognition in national and international conferences
- Travel awards to present research posters at the national/international conferences

- Internal awards for best poster presentations at the Annual SOP Research Poster Competitions
- School of Pharmacy Graduate Millennium Award

In addition to these awards, students who demonstrate an outstanding academic performance during the graduate program are eligible to be awarded the title of “**Fellow of the School of Graduate Studies**”.

Faculty

SOP has one teaching Excellence Award in the undergraduate program. The recipient of the award is selected by students of the graduating class. The following are the criteria used in the selection:

- Have a comprehensive knowledge of the subject
- Be habitually well prepared for lectures, laboratories, seminars, tutorials, clinical practice experiences, etc.
- Have enthusiasm for the subject and the capacity to arouse interest in it among the students.
- Encourage student participation in the teaching/learning process
- Set a high standard and successfully motivate students to attain such a standard.
- Communicate effectively at levels appropriate to student’s capacity.
- Utilize methods of evaluation of student performance which stress an understanding of the subject, rather than just the ability to memorize.
- Be accessible to students outside of class hours.

Professional Recognition and Alumni Awards

Students may nominate pharmacists who have served as preceptors in hospital practice and community practice who they feel have had a significant impact during their practice experience. These outstanding preceptors, one in each practice category, are recognized at the Annual Awards Ceremony. In 2009 the School established the Alumni Achievement Award to recognize outstanding alumni. This award is also presented at the Annual Awards Ceremony.

University Wide Awards

The university offers a number of awards to faculty and staff that recognize outstanding teaching, research, community involvement, volunteerism, services etc. In 2010, Dr. Leslie Phillips was the recipient of the President’s award for distinguished teaching.

Administrative Organization and Support

The size of the SOP relative to other academic units at MUN is reflected in its organizational structure. There is a Dean and two Associate Deans, one for Undergraduate programs and one for Graduate Studies and Research. The Dean is appointed for five years and Associate Deans for three. The incumbents are in their second terms, all of which are scheduled to expire on December 31, 2013.

The Dean is responsible for overseeing the administration, development and delivery of the undergraduate, graduate and research programs. The Associate Deans provide support and aid in decision making in those areas relevant to their respective portfolios. Direction is further provided by standing committees and Academic Council. As a small unit the School does not have formalized departments.

The Senior Administrative Officer (SAO) provides oversight of all administrative matters within the unit and provides significant support to the Dean. Reporting to the SAO are an Intermediate Secretary who provides secretarial support to the Dean, an Administrative Staff Specialist responsible for overseeing budgets, finance and special events and two Intermediate Clerk Stenographers who provide clerical services to the faculty and staff. The Laboratory Instructor and Pharmacy Skills Instructors are responsible to individual faculty whose courses involve laboratory activities. There is a Structured Practice Experience Coordinator, Development Officer, Manager of Academic Programs, Communications Coordinator and two Drug Information Pharmacists who report to the Dean regarding professional matters and to the SAO regarding administrative issues. A Grants Facilitator works closely with the Associate Dean of Graduate and Research Studies.

The SOP has seen its administrative support staff increase significantly since the last APR. This expansion allows SOP to carry out its daily operations in an efficient manner, participate more broadly in university-wide initiatives, respond to student needs, grow support, increase our profile and be more strategic.

The administrative organizational structure of the school is presented in Appendix 12.

While the School is not departmentalized, Social Administration Faculty and the faculty responsible for Pharmacy Practice meet regularly and work collaboratively. The Drug Information Pharmacists also

participate in meetings of the group as necessary. The coordinators of the Pharmacy Skills stream of the curriculum also meet on a regular basis to review the courses and discuss issues of mutual concern (e.g. standardized patients, evaluation tools, etc.).

The pharmacy practice group works well resulting in significant progress in the therapeutics and skills courses and experiential learning program. The group has clear objectives, ongoing discussions of issues, a collaborative approach to decision making and a unified voice to advocate on behalf of pharmacy practice issues. As the program expands, consideration will be given to the formation of formal divisions within the school.

The Constitution of the school (Appendix 13) as approved by the Senate of the University, ensures the school maintains autonomy in areas of strategic planning, curriculum development and delivery, graduate studies and research, admissions, awards and experiential learning. Amendments are proposed as necessary to reflect changes in committee structure and terms of reference.

Faculty

Of the faculty complement 17.55 Full Time Equivalents (FTEs) are tenured or tenure track. Additionally, there are three FTEs in three-year regular term appointments and 0.4 FTE in a teaching term appointment shared with nursing. There are two clinical assistant professors who hold primary appointments with Eastern Health. There are 13 FTEs in the pharmacy practice area, 6 FTEs in pharmaceutical sciences and 1.55 FTE in the social/administrative area and 0.4 in biomedical sciences. We have a professor emeritus and one tenured faculty member who holds the position of Vice-President (research).

Sessional lecturers have been hired on a variable basis to cover teaching in order to provide teaching remissions for administrative duties and leaves, following resignations of faculty and to cover courses requiring expertise not available in the school. However for the 2012-13 year we anticipate only one sessional appointment.

As a result of the announcement in 2009 to expand the school we have begun recruitment of faculty and staff. We identified the need for 5 pharmacy practice, 2 social/administrative and 3 pharmaceutical sciences faculty. Currently five faculty positions have been filled. We have been advised by the Senior

Administration that until the school expands its enrolment we will not be permitted to recruit any new faculty positions. Additionally six staff positions were identified, some of which have already been recruited (i.e. Communications Coordinator, MAP, Pharmacy Skills laboratory Instructor, DI pharmacist, Senior Administrative Officer and Grants Facilitator).

Support Staff

Number and Type of Support Staff and Changes in Complement

There are 13.16 full time equivalents (FTEs) staff. This compares with a total of 7.6 FTEs in 2008 and 6.5 in 2003.

The support staff positions and the date they were established are outlined in Table 9.

Table 9: Administrative, Professional and Technical Support Staff

Title	FTE	Year Established	Comment
Senior Administrative Officer	1	2012	
Administrative Staff Specialist II	1	1986	
Intermediate Secretary	1	1988	
Intermediate Clerk/Steno	1	1999	New position created to support faculty at Tiffany Court
	1	2011	
Structured Practice Experience Coordinator	1	1986	
Drug Information Pharmacist	1	1994	Contractual appointments. Provide support to Skills laboratories also.
	1	2010	
Development Officer	0.5	2007	Shared with Nursing
Manager of Academic Programs	1	2009	
Communications Coordinator	1	2010	Contractual appointment
Laboratory Instructor	0.66	1986	Works full time from September to April
Pharmacy Skills Laboratory Instructor	1	2009	Contractual appointment
Grants Facilitator	1	2012	Contractual appointment
Computer Support		2006	Service Level Agreement with Computing and Communications for 3.5 hours support daily

Contributions to the Unit

The staff has grown considerably over the past few years and this has substantially enhanced the operations of the unit. With the hiring of individuals with a specialized focus (e.g. development, communications, and academic program support) we have become more effective in these areas, seized opportunities which we would not have been able to pursue and enhanced student support and educational experiences. We are supporting our faculty in research through the establishment of a grants facilitator and we anticipate this will result in greater successes with research funding.

Everyone has the opportunity to be engaged in the development of the strategic direction of the unit so that there is a sense of ownership and commitment. The staff works highly collaboratively with each other and with the faculty and are significant contributors to the success of the students and the School.

Monthly faculty and staff meetings are held so that everyone in the unit has an opportunity to provide input on operational and academic matters, and to engage in the social community of the School. Faculty only and Staff only meetings are also held to discuss issues of significance to these specific groups.

Student Support and Student Life

In 2009 a new position, Manager of Academic Programs was established to support a variety of student related activities – admissions, student progress monitoring, scheduling of classes and examination, liaison with the Registrar's office, student advising, etc. This has been an invaluable addition to the support services for students.

There is a Memorial University Pharmacy Society (MUPS) which oversees the social aspects of student life while the Canadian Association of Pharmacy Students and Interns (CAPSI) representatives focus on professional development. We are very proud of the level of student engagement in the community, through various activities such as participating in events such as Relay for Life and Pharmacists Awareness Week, and supporting the school's annual Christmas charity for families in need. Many social activities are planned during the year and some of these are attended by faculty.

Celebrations of student success include such events as the annual Awards Ceremony, the White Coat Ceremony and Graduation.

Our main concern relating to student life is the inadequate facilities. There is no gathering space for students in which they can socialize or work together on projects or academic endeavours. Additionally the fractionation of the faculty is having a negative impact on relationship building between the faculty and the students.

Further information on the support services available to students on a university wide basis is available in the CCAPP Self-Evaluation document (Appendix 2).

Physical Resources

Space

Faculty , Staff and Teaching Space

Space is at a premium in the school and there have been serious concerns about the adequacy of the space for many years now. Each of the accreditation self-assessment reports (2001, 2003 and 2008) and subsequent site visit evaluations noted that space was inadequate and the reports of the review committees supported such findings. The choices we had were to limit faculty and staff growth which would have had a negative impact on the teaching and research programs of the school or to move ahead with recruitment and accept the considerable space limitations.

After several years of having some faculty members share offices, it was agreed to move the pharmacy practice group to an off-site accommodation at Tiffany Court. While this has resulted in better office accommodations for faculty and space for summer undergraduate students, it has come at a considerable price. Faculty and students no longer have the benefit of ease of engagement or casual points of contact which strengthen and enhance the student/faculty relationship. Additionally pharmacy practice faculty spend extra time commuting between the TC site and the HSC site when teaching and attending meetings. Appendix 14 shows the floor plans for each site.

Student Space

As has been noted previously there is no social or gathering space nor are there study rooms for students in the School. There are a few benches, locker space and mailboxes for students and one small room for the student societies. Students have access to computer facilities in the library. They also have access to computer facilities within the Professional Practice Lab although there are limits to access during the daytime as labs are on-going.

Even from the early days of the School, social space was limited but there was some available. However, as the School has grown, what little space was available has been converted to faculty offices. This lack of space disadvantages students and it negatively influences the positive community spirit which the School attempts to foster.

Cost Effectiveness

The AFPC Mission Statement for Pharmacy Education in Canada states:

“The mission of pharmacy education is to provide programs of excellent quality which by their content and presentation produce graduates who contribute significantly to societal, professional and patient care responsibilities, and who are committed to lifelong learning.”

To achieve this, a variety of programming approaches are utilized across the country by the Faculties/Schools of Pharmacy to achieve this common goal. Additionally, supports available to the Faculties/Schools also influence delivery approaches and cost. Therefore it is challenging to do a comparative analysis of MUN's program delivery and its efficiency to that of others across the country. That said, a scan of other comparable Schools/Faculties of Pharmacy in terms of budget, faculty complement and enrolment was conducted.

Table 10: A Comparative Look at Pharmacy Programs in Canada*

University	Number of students (UG + G)	Number of Full time faculty	Faculty: Students (%)	Annual Cost per Student
Dalhousie**	345	23	6.7%	\$ 7,688
Saskatchewan	518	36	6.9%	\$10,432
University of Waterloo***	428	41	9.6 %	\$ 11,475
University of Manitoba	218	23	10.6 %	\$16,345
MUN	169	20.55	12.2 %	\$15,153

**Based on 2010-11 data*

*** Pedagogical approach is PBL*

**** Co-operative program*

At first glance the cost of Memorial's undergraduate program appears to be on the upper end, however there are some extenuating factors that contribute to this cost including:

- Lack of well developed, comprehensive clinical services or residency programs in the Regional Health Authorities which places the burden of responsibility for clinical teaching and supervision on pharmacy practice faculty and not on clinical practitioners.
- There are no economies of scale as there is a minimum threshold of costs for the delivery of any program regardless of size.
- There are different models for program delivery used across Canada so it is difficult to compare. For example, Dalhousie utilizes a PBL approach to its program delivery, while Waterloo is based on a co-operative model. MUN has a very intensive Pharmacy Skills curriculum which is very labour intensive. Most programs benefit from strong clinical supports in the community but Memorial faces challenges in this regard (as previously noted).
- Our graduate program does not have professional degree program graduates who could serve as Teaching Assistants (TA's).
- Costs include support of Drug Information Centre (DIC) that serves not only the SOP but the Regional Health Authorities and other health care practitioners who may need detailed information. This is a unique model.
- As the SOP is confined by space it has had to lease off-site space to accommodate faculty and staff thereby raising the costs of program delivery considerably.

The Future – Challenges and Opportunities

As mentioned earlier in the self-study, the provincial government announced in 2009 its desire to strengthen healthcare in the province and provided the SOP with additional funding of \$1.5 million annually for three years to help support the expansion. This amount will eventually be rolled into the base budget of the school once expansion is complete. The funds were to be used for additional faculty members, professional staff members and establishing a partnership with PANL for the delivery of a provincial professional development program for pharmacists.

While the SOP has been able to make progress it is stymied by the lack of physical space to expand student enrolment. Since government's announcement requesting that the school expand, a functional planning study was conducted and identified space requirements not only to permit undergraduate expansion, but to support our research activities and desired expansion of our graduate programs. Additional faculty and staff have been hired in anticipation of increased enrolment. This has resulted in the school needing off-site space for offices. There is an opportunity for a limited expansion when some units in the Faculty of Medicine move to space in its new building. However, there is still not enough space to permit expansion to 60 students. At most, the school will be able to responsibly accommodate only 46-48 students per year and many of the problems and challenges with our current space will continue to exist. Indeed, our physical environment will be further fractionated as we now make plans to occupy space on the first and third floors of the HSC and at Tiffany Court. We will be expanding only to assure government of our commitment to increase enrolment.

A further challenge as well as opportunity arose when on January 23, 2013 the Faculty of Pharmacy at the University of Toronto was informed that their application for an ELPD had been approved. The SOP had been awaiting the outcome of the application for several years as it did not wish to commit to moving in the direction of ELPD if approval in the larger provinces did not occur. As we look to the future, it is inevitable that we should move in the direction of ELPD so as not to disadvantage our students. However, at the present time with the challenges we face with infrastructure and clinical placements as well as the desire to expand, we will have to have a well-developed plan which addresses these factors before we will be able move forward. Exciting times lie ahead for the School of Pharmacy.

