

**Internal Academic Review 2006-2007
School of Computing
Internal Academic Review Committee Report to Senate**

The Internal Academic Review (IAR) of the School of Computing is now complete. The Internal Academic Review Committee (IARC) has taken into consideration all of the submissions related to the IAR of the School of Computing and respectfully submits the following report. The IARC Report to Senate is intended to supplement the findings of the attached Review Team Report and to provide a mechanism for the Director of the School and the Dean of the Faculty of Arts and Science to jointly report on the progress in addressing the Review Team recommendations (please see the “Outcomes” section of this report).

Summary of the Internal Academic Review of the School of Computing

The School of Computing is to be commended for their innovative and successful advancement of both specialized and multidisciplinary programs in a field of science that is experiencing rapid and frequent transformation. The Senate Internal Academic Review Committee (IARC) applauds the record of faculty members’ success in research grants and awards, and the dedicated administrative and technical support staff assisting the work of the School of Computing.

The IARC agrees with the reviewers that the limited teaching and research space, and the need for renewal of the faculty complement, must be addressed as the School of Computing develops its future academic plan, and that substantive progress will require additional resources for the School. The IARC encourages the School of Computing to engage in a strategic planning discussion, including a comprehensive curriculum review, with the Faculty of Arts and Science. While the growth of the graduate program in the School holds much prestige and integrates well with goals of the Queen’s Strategic Plan, the IARC agrees with reviewers that the undergraduate program should be a strategic focus as well. The IARC agrees with reviewers that the undergraduate program should be a strategic focus as well.

IARC recommends the School develop plans and approaches to deal with the pressing issue of space while recognizing the unique program requirements for computing laboratories.

The IARC recognizes the School of Computing for its progress and creative problem solving and fully supports the School and the Faculty of Arts and Science working in collaboration to explore new ways to address the recommendations outlined in the Review Team Report.

Outcomes of the Internal Academic Review of the School of Computing

*Joint response submitted by the
Dean of the Faculty of Arts and Science and the
Director of the School of Computing*

Space:

The Faculty of Arts and Science recognizes the importance of addressing the significant issues related to adequate space in the School of Computing. The School has engaged various creative, but temporary, solutions to optimize use of the present space. The undergraduate laboratory mentioned in the IAR report has been moved back to a renovated facility in Walter Light Hall. The Faculty and the School have worked cooperatively with other university units to acquire alternate space for certain Computing research laboratories. Active efforts to identify other space that might be occupied by the School of Computing are ongoing. As the external reviewers note, the School of Computing needs a considerable

reviewers advocate that faculty appointments in the core areas of computing are needed to redress faculty turnover and to complement appointments made in applications areas of computing. The Faculty and School recognize the importance of securing resources for renewed investment of faculty members in the core areas of Computing.

Curriculum:

To maintain the status of its undergraduate curriculum as one of the most dynamic, challenging, and innovative in the country, the School of Computing has joined with the Faculty of Arts and Science to engage in regular, comprehensive reviews. These reviews have recently led to several significant curriculum modifications in response to changes in the technological environment and student interests. For example, the School has added several novel introductory computing courses, new opportunities for students to become engaged in programming, more course options for students in certain degree programs and a new program in Computing and Concurrent Education. Additional changes, particularly interdisciplinary programs, are being considered. The Faculty of Arts and Science and the School of Computing have together enhanced the administrative mechanisms that will allow Biomedical Computing students to access the courses needed to fulfil their degree programs. The School remains committed to a vigorous graduate curriculum which is supplemented by a number of seminar series where both graduate students and faculty members present their research in a spirit of scholarly exchange.

Follow-up on these recommendations and issues will take place during the annual academic planning and budget process between the Dean of the Faculty of Arts and Science and the Vice-Principal (Academic).

Attachment:

Review Team Report

QUEEN'S UNIVERSITY
SCHOOL OF COMPUTING
INTERNAL ACADEMIC REVIEW

INTERNAL REVIEW TEAM REPORT

March 9, 2007

Submitted to the Senate Internal Academic Review Committee by

Christopher Ferrall (Economics), Chair of the Internal Review Team

on behalf of the Review Team

Dr. Andrew Daugulis (Chemical Engineering)

Ms. Peg Hauschildt (Physics)

Dr. Barbara Kisilevsky (Nursing)

Mr. Brian Kuchar (Political Studies)

Dr. Kevin Munhall (Psychology)

Mr. Jonathan Vandersteen (Civil Engineering)

Executive Summary

Since its last IAR, the School of Computing has experienced significant growth and development in its faculty and academic programs. This is reflected in the external consultants report (CR) and the School's rise from #7 to a #5 ranking within Canada.

Based on our meetings with the faculty, students and external consultants we have found broad agreement on the strengths, weaknesses and threats to the School. To a great extent we concur with the ranking of these concerns by the external consultants and their recommended responses. These responses are prudent steps to manage and stabilize the growth that has occurred.

We stress three recommendations.

Issue 1. Space

The primary weakness of the School is physical space. Concerns about space are prominent in the Unit Self Study (USS), the report prepared by the Computing Students' Association (COMPSA), and the Consultants' Report. The tour of the facility taken by the Review Team confirmed these reports. Computing is not the only unit on campus struggling with inadequate space. However, Computing is the unit under review, and it is truly constrained by both the quantity and quality of space available. Lack of appropriate physical space is a threat to the research environment and each academic program as well as student safety and equal access.

The single best response from the University to this IAR would be to work with Computing to find a way to address the space needs of the unit. This would be to work with Computing to find a way to address the space needs of the unit. This would be to work with Computing to find a way to address the space needs of the unit.

COMPSA also reports that “many students” do not find the undergraduate degree challenging enough. To have a unit’s majors worrying in print about the challenge of their courses should serve as a warning sign. In addition, the Consultants express concern about the level of support given to the Cognitiv

after 2001 the graduate program has grown. This is not unexpected, since Bachelor degree holders with poorer job prospects are more likely to choose graduate school to bolster the skills and ride out a downturn.

Addressing the main issues of space and faculty in core computing would make a significant difference in the graduate program. However, graduates use space quite differently than undergraduates. Thus, much more needs to be done than simply moving the Jackson Hall laboratory. At least three newly renovated labs are relatively spacious and equipped for mixed use. The same cannot be said for other labs and for the general office and seminar space. For example, experimental work with patients in biomedical computing is carried out in the same space as graduate students have desks. At the least this is inefficient (if students must leave during experiments). At worst it is inappropriate (if other students continue to work while experiments go on).

All signs point to high morale and cohesion among undergraduates, but there are signs pointing in the opposite direction for graduate students. The Consultants' report that some supervisors discourage students from doing anything but their own research, including going to seminars. The USS lists just 6 outside seminars last year, which seems a small number given the size of the faculty and the PhD program.[†] Establishing regular seminars in different areas that several groups commit to attending each time is one method to create cohesion.

A key issue in both the USS and the Consultants' Report is funding for international graduate students. This appears to be addressed already by Dean Deakin's proposal, but we note that Computing is seriously affected by the existing scheme that makes international students difficult to attract.

Scholarship and Research

As emphasized in the Consultants' Report, the School has become stronger in research since its last IAR. The record of awarded grants is excellent. Faculty have received funding from all three councils and multiple CFI grants.

Since the last IAR, faculty in Computing have received prestigious research awards, including the Premier's Research Excellence Award and the Queen's Research Award.

[†]By way of comparison, Economics hosted 15 outside speakers spread over 5 seminar series in September-October 2006. Annually it hosts 2 endowed public lectures.

Teaching and Learning

Our comments in this area can be found in the previous sections.

Service

The School offers important programming courses for the rest of campus, including the newly introduced CISC-081. Faculty members participate in university committees.

Resources

Space has been discussed earlier. Overall, the support staff situation is good with some issues that need to be looked at carefully by the School.

The staff position to support grants is uniformly seen as an excellent approach.

Several staff positions are funded on soft money without the benefit of continuing appointments. While the department appears comfortable with the current situation (based on the USS and follow-up discussions), concerns are raised in the Consultants' report. The issue is whether lack of job security could affect morale and continuity if staff leave to take up more stable positions on campus. Also, there are concerns about the distribution of the workload across staff. The expanded graduate program has placed a heavy burden on the graduate coordinator.

Plans for the Future.

The major planning issue is space. While renovations funded by CFI have been very helpful, at this point the School must address space from its own perspective. We applaud the School for making the most out of what it has and for maintaining morale in the face of imperfect facilities.

What seems to be missing from the USS and from discussions with the School leadership is a longer-term plan to address the resource issue. Renovating and re-organizing existing space can only go so far. New space is clearly required, and the University must help the School obtain it in order to protect the academic programs threatened by crowded and ill-suited conditions. But for its part the School appears to have no plan for accumulating funds which, in effect, would meet the University half-way. The close connections to industry and the improved high tech sector would seem to make this possible.

Review Team Activities

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| October 4, 2006 | Organizational meeting; discussion of the Unit Self-Study. |
| October 25, 2006 | Tour of the Facilities, including a meeting with Jim Cordy, Pat Martin and Dean McKeown to discuss the USS. |
| November 17, 2006 | Meeting with the External Reviewers. Student members meet with student groups. |
| February 7, 2007 | Meeting to begin drafting this report. |
| March 9, 2007 | Submission of the report to the Senate IAR Committee. |

Please find the External Consultants Report attached.

**External Academic Review
School of Computing
Queen's University
December, 2006**

Executive Summary

The School of Computing is central in providing specialist programs in computing and multidisciplinary programs that study computing as an enabler for other disciplines. These programs provide an education for students interested in other disciplines and computing specialists.

The School of Computing has significant research strength in software engineering and theoretical computing science and there is strong evidence of emerging strengths in biomedical applications and human-computer interaction. There are strengths in system related areas that could become significant strengths with appropriate hires. There are several expected retirements in core areas. The School needs to be able to replace these positions to maintain its ability to teach courses in core areas.

The undergraduate program is strong but between the retirements and the increased expectations of new faculty members there is a reduced amount of time spent on the undergraduate curriculum. There are concerns about the quality of space assigned to undergraduate students that must be addressed.

The graduate program is strong. There were two concerns. The first is the lack of social cohesion. The second concern is the rejection of international students due to a lack of funds.

The most immediate concern identified is space. Assigned space is either not enough for the purpose the space was assigned for or does not suit the purposes it was assigned for. There are problems with student space and research laboratory space.

The staff are excellent but the graduate coordinator appears to be overworked as the result of the large increase in graduate students in the last several years. The soft positions should be made permanent.

The School has relatively high female enrollment.

The School has made great progress towards achieving a 5th place ranking in Canada. However, we believe that space is a major issue that could impact graduate recruitment which could make it difficult to achieve and maintain the 5th place ranking. The competition for 5th place is strong and the primary weakness of the School is space.

applications. What makes this program unique in Canada is that most related programs primarily focus on bioinformatics while this School's program also looks at algorithms for medical applications. As research in biology and medicine becomes increasingly more computational the Biomedical Computing program is both innovative and timely.

The School offers several courses to enhance communications skills (CISC-499, CISC-497, CISC-498 and CIS-499). These courses require students to write and present. Each student must take at least one of these courses. This is an excellent idea especially considering the importance of team work in much of industry including collaboration with team members that are remote.

A concern relayed to the external consultants is that there are two faculty members essential to the Cognitive Science program. One is from Computer Science and one is from Psychology. The program rests on these two people who teach the courses developed especially for the program as overload teaching. These faculty members are due to retire in the foreseeable future which would impact the ability to offer these courses. Additional teaching support needs to be provided to the Cognitive Science program.

Undergraduate students' comments exhibit a strong sense of community. The students

- There is concern about the lack of depth in the biomedical computing program. Students are not convinced that they have enough knowledge of either computer science or biology.
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The following recommendations are made.

1. Provide a lounge for graduate students.
2. Enhance the social activities of the graduate students.
3. Discuss with faculty the importance of attending seminars. Students should not be actively discouraged from doing so.
4. Introduce a required graduate research seminar where faculty and students present research results. This should be coordinated jointly by a faculty member and a one or more students.
5. Open hallway doors in the during regular work hours.
- 6.

only two faculty members in these areas. The School should consider hiring more people in these areas.

Recommendations:

1. Hire faculty in whose research interests are in the core areas of computer science especially in databases and networking.

5. Faculty

The School hired four new faculty members in the biomedical application areas and software engineering. The four new faculty members appear to be collaborating with each other, more senior faculty and faculty in the other departments. They are either PIs or co-PIs on CFI, OIT and CIHR grants. With the faculty hired in the late 90's and the four hired recently the number of graduate students has tremendously increased and appears to be approaching steady state. Research funding is high.

As the School loses faculty to retirements or other reasons it is important that the School be allowed to replace those positions. The next wave of retirements is expected to be in the core areas of Computer Science. Not replacing these faculty members not only hurts the research profile of the department but also would negatively affect the teaching of courses.

An observation made from the reading of the CVs and discussions with faculty members is that many faculty members (especially junior faculty) are not doing much service work. This can be attributed to the following: (1) Agreements that new faculty not be given committee work right away. (2) Increased workload on faculty through graduate student supervision and the effort expended on getting grants especially by junior faculty. The impact includes less time to participate in recruitment activities (e.g., attending the university fair in Toronto) and curriculum reviews. One suggestion was that administration makes a list of tasks that need to be done throughout the academic year. This list would be provided to the faculty in the summer. Faculty would choose at least one task.

Recommendations include the following:

1. Replace faculty when a position is freed up as a result of retirement or some other reason.
2. Plan the list of administrative tasks as early as possible and allow faculty to choose from the list.

6. Space

The School has done an admirable job of dealing with the space allocated to it. However, the School badly needs new space. The School has increased the number of graduate students in the last seven years reversing a trend of a decreasing number of students in the 90s. The School has been unable to properly accommodate them. Another factor contributing to the School's space woes is that many faculty members require experimental research laboratories. This type of laboratory consists of specialized equipment used for a specific camera, equipment being used in such a fashion that would not be appropriate in a general environment (e.g., loading a network switch), or equipment associated with experiments dealing with human subjects. This is in addition to laboratory space needed to provide desk space for graduate students. The School is unable to properly support either type of space. We were especially concerned with the same lab space being used for graduate student desks and experiments involving human subjects. The School has tried to make this up by converting some undergraduate laboratory space to research laboratory space but this is insufficient and the loss of undergraduate laboratory space will negatively impact undergraduates when the enrollments start to increase. The lack of space could impact graduate student recruitment since many universities in Ontario have accommodated graduate student and faculty growth with either new buildings or additional space in existing buildings that have been renovated.

The computer-aided surgery group needs additional laboratory space that is easy to clean.

Concerns were expressed by undergraduate students, graduate students and faculty about the locked staircase doors. All felt that this had a negative impact on the sense of community.

There were concerns about the undergraduate laboratory in Jackson Hall and the lack of lounge space.

Recommendations include the following:

1. Move the undergraduate laboratory in Jackson Hall to Goodwin Hall.
2. Provide "lounge" space adjacent to the undergraduate laboratory.
3. Unlock staircase doors from 9 to 5.
4. Find more space to allow the separation of student laboratory space and experimental laboratory space.
5. Find additional space for biomedical research.

7. Staff

The School's staff is categorized as follows: (1) Administrative or secretarial support staff and (2) Technical support staff.

The staff members are excellent. We were impressed with the enthusiasm and general happiness that the staff had with the work environment. This is evident with the awards they are winning. We find the research administrator position to be innovative. The increasing number of sources of funding along with complexity of rules governing spending is becoming overwhelming. We were concerned that this was a soft position as well as two other staff positions. The loss of these positions would tremendously increase the already busy workload of faculty.

The Graduate Studies Assistant has seen her workload increase as a result of the increase in graduate students. It is recommended that help be provided to her to deal with the increase.

Recommendations include the following:

1. Find ways to help the Graduate Studies Assistant
2. Make the soft positions permanent.

8. Equity

The School has special strength in attracting women in the field. As far as we know the School has the highest percentage of female students in Canada and one of the highest percentages in North America. The decline in female students in the last several years is small compared to other schools in Canada. Relatively speaking there is strong female representation on the faculty including two full professors. The School aggressively pursues a policy of accessibility for the handicapped.

9. Summary

The School has made great progress towards achieving a 5th place ranking in Canada. However, we believe that space is a major issue that could impact graduate recruitment which could make it difficult to achieve and maintain the 5th place ranking. Renewal of faculty is an absolute must. The competition for 5th place is strong with the current primary weakness of the School being space.