I. Introduction

The university’s strategic plan includes the acceleration of biomedical research and related graduate research education at the institution. The vision will transform our academic culture to a research-based one, and is intrinsically aligned with our university mission to “produce, in a humanistic tradition, healthcare professionals and biomedical knowledge that will enhance and extend the quality of life in our communities.” Reflecting our institutional transformation to evidence-based approaches found in scientific research, the panel’s inquiry centered on evidence for institutional capacity for graduate research education and specifically, biomedical research. Members selected the following themes were selected because best practices would indicate they are necessary prerequisites for implementing the overarching goal of graduate research education with a focus on biomedical research: adequacy of faculty numbers, faculty workload, space and facilities, academic program review, research environment, faculty qualifications and backgrounds, student services, library capacity, and academic planning. In addition, the faculty WASC survey of 2005 indicated concerns by faculty that were integrated into the panel’s inquiry, specifically, concerns about faculty numbers and workload dedicated to teaching relative to research.

Preparation for Educational Effectiveness

Two themes the panel investigated are related to past WASC recommendations involving clarification of faculty workload policies, and, the need for an institutional system of academic program review. The panel is mostly focused on capacity issues surrounding planning and building capacity for the new focus of biomedical research, and a future college which supports this vision. As Western University is an emerging institution in biomedical research, the initial phase includes building a graduate research program that will enhance the faculty capacity to conduct research. Currently, the College of Pharmacy has led the way by offering a professional Master’s degree in Pharmaceutical Sciences, during which students participate and collaborate on research projects with faculty researchers. Within the last year, a critical mass of faculty have established active research programs at the institution; the next phase of development will focus on their ability to provide quality education for graduate research students, as we continue to enhance research faculty recruitment. Attracting quality students begins with quality faculty, so that is why the focus of this report is primarily faculty and facility issues. Through participation in a program review process at the institution, the future college will be able to monitor and continuously improve the educational quality for students. Initially, the institution will review proposals to offer a post-baccalaureate degree to enhance candidates professional school competitiveness. In conjunction with this program we plan to concurrently establish a academic Masters’ degree(s) program, and later, a PhD degree program. All these programs will require submissions of Substantive Change Review to WASC. At that time, initial educational quality will be assessed by programs, the institution, and WASC. We seek to transform our culture to a research-oriented culture for both biomedical research and educational research, and providing opportunities for both. Currently, our students can participate in a Master of Sciences degree in Pharmaceutical Sciences for bench-side research and a Master of Health Science degree for educational research. The focus of this report, however, will be biomedical research.

Alignment with WASC

By investigating capacity for biomedical research, we are aligning our inquiry to our central core of our institutional mission and derived educational objectives (CFR 1.2). In addition, the proposed college is included in the university’s strategic plan (CFR 4.2). Based on the increasing diversity of research intended to enhance the quality of life for patients, and the positive health impacts of biomedical and translational research, we are responding to a societal needs for diversification of research areas and interdisciplinary approaches (CFR 1.5). In addition, we are responding to student educational interests for those students interested in bench-research in the biomedical sciences, and helping to promote future health care practitioners who can collaborate with biomedical researchers, by making these academic programs available for our current and future students. The 2006 medical college survey indicated medical students have interest in basic science and clinical research. The theme of faculty numbers and qualifications address CFR 2.1, by addressing the institution’s ability to hire a sufficient number of faculty with
appropriate qualifications for its purposes (CFR’s 3.1 and 3.2). We are also building capacity to be able to meet CFR 2.2, by developing graduate students academic abilities to engage in ongoing research and literature of the field. By investigating library capacity, Western University will ensure student access to appropriate information and resources for conducting quality biomedical research (CFR 2.3, 3.6 and CFR 2.13). The future program(s) will include faculty who take collective responsibility for satisfying a system of university program review (CFRs 2.4 and 2.7). The investigation of the university’s faculty research environment, faculty workload (CFR 3.3), and qualifications, as well as lab and facilities (CFR 3.5), will assist in creating a culture of quality research, and this will also promote scholarship appropriate for our institutional purposes (CFR 2.8). The investigation of Western University’s student services and library, future graduate students will have essential elements of their learning environment that meets their needs (CFR 2.10 and 2.11).

The First Year Survey and Graduating Surveys conducted by the university will assist with identifying research student levels of satisfaction in the future program(s) (CFR 2.10 and 2.11). Aligning resource allocation to the university’s strategic plan and this panel’s recommendations to enhance future biomedical graduate research education (CFR 4.2), by using evidence to inform panel’s recommendations (CFR 4.3), we are enhancing institutional and educational effectiveness. The panel’s process of comparing Western University to our peers using IPEDS data demonstrates use of evidence to strategically align use of institutional research on our campus (CFR 4.5); and recommending a program review process will demonstrates a future quality assurance process (CFR 4.4). Finally, the panel’s investigated theme of capacity for biomedical graduate research education demonstrates academic leadership (CFR 3.11).

i) Faculty Workload

Best Practices

Faculty have many and diverse demands placed upon their time such as class preparation, class time, interacting with students outside of class, exam preparation and grading, mentoring of students, collegial activities with other faculty members, committee meetings, administration, keeping current in their field, obtaining extramural funding, conducting research, producing scholarship, providing leadership, participating in governance, as well as time devoted to community and university service. Often there are attempts to address workload issues by replacing faculty positions with non-faculty hires. This places additional stress on remaining faculty time by reducing the number of faculty available to address leadership, committee, and service activities. Additionally, there are reduced extramural funds to support research, which creates more competition for funds, increasing the average number of research applications (each grant application requiring time to prepare) that are submitted before funding is achieved. With less extramural support, the expectation for faculty-generated research has not decreased. Less support for research means fewer technicians and post-doctorial fellows hired to conduct experiments, and often requires faculty members to engage in the bench work themselves, thus, even further exacerbating faculty workload issues. On average, academic faculty work between 45-55 hours per week, and have less discretionary time than they did in 1972.

Workload issues are frequently a source of conflict among faculty and administration. There is a tendency to expand or produce new programs, and only when workload exceeds available resources, is additional help sought. This practice is not without a price, as it leads to an uncertain work environment and greater faculty attrition. The amount of faculty time available to perform the required work is often over estimated, by college and/or university administration. Frequently, vacation, sick time, national holidays, educational leave, and professional leave are not considered when workload issues are addressed. It is assumed that the faculty member is present for work 52 weeks a year; when in reality, after the above acceptable absences are considered, an individual faculty member may only be at work 42 - 44 weeks per year. This means institutions often underestimate of the number of faculty required to address the work at hand and is another pitfall to avoid.

Best practices indicate that faculty workload expectations must be realistically determined and acknowledged. Workload should be assessed regularly and planned expansion of programs should include a realistic increase in the number of faculty that directly coincides with the
increase in workload, ideally increasing faculty numbers prior to an anticipated workload increase. Failure to accurately determine faculty workload may lead to faculty unrest and instability.

After completing the literature review used to establish the best practices, we compared the identified best practices to results of a comprehensive faculty survey, inviting faculty from all colleges, to explore and analyze WesternU's faculty perspectives on current workload, especially as it related to graduate research education.

**Major Findings at WesternU**

The survey response rate was over 72%. Two-thirds (68%) of the faculty indicated they work more than 40 hours a week, with 13% of the faculty working more than 60 hours a week. Most of their time is spent on teaching, with 71% indicating they spend greater than 16 hours per week on teaching. Sixty-two percent of the respondents indicated they spend less than 15 hours per week on research activities. According to Spitzer Profile (Spitzer, 1972), the relative weighting of the three characteristics of faculty work in Research Universities (Carnegie classification) is divided between 40% (16 hours) on research, 40% on teaching (16 hours), and 20% (8 hours) on service. Since WesternU has historically been a teaching institution, faculty roles are focusing more on the teaching activity than research and service. However, 75% of the faculty want to decrease their teaching workload and increase their research activity, according to the survey results. Approximately half of the respondents perceive that their current workload is more or much more than they expected, and the workload is more or much more at WesternU compared to the workload at other institutions.

Seventy percent of the faculty members want to conduct more research, and believe they do not have enough time. All things considered, 72% of the faculty members are slightly, somewhat or very satisfied with their workload at WesternU. Additionally, 38% of the faculty feel burned out by their work and are asked to serve on too many committees. An indication of a potential concern is that 76% of the respondents believe that the pace of their work seems to be increasing annually.

Overall, a majority (75%) of faculty are interested in conducting research if given release time from teaching, and want to contribute to graduate research education (77%). Forty-eight percent of the faculty members are willing to participate in research, and 38% in teaching in the graduate program up to 10 hours per week, while 62% are willing to mentor graduate students.

**Recommendations**

Keeping in mind the best practices identified in the review section above, it would be wise to hire more faculty in conjunction with (or even better prior to) the starting and expansion of the graduate research program. From the results of the faculty survey, it appears that faculty workload is currently slightly higher than desired. By adding a new program of graduate research education without a commensurate increase in faculty numbers, workload levels may reach the level where faculty unrest and instability may result. Also, since there is a desire of many faculty members to enhance their efforts in research and graduate education, it would be wise to investigate mechanisms to provide release time to promising individuals so they could perform more research and graduate education. Effective approaches to provide such release time need to be investigated. A review of institutional faculty workload policies related to graduate research education should be conducted.

**Continuing Challenges and Reflections**

The recommendation to hire more faculty raises the issue of finding the financial resources to achieve this goal. This may be particularly difficult at a time where three new health professional colleges, in addition to the graduate college, are being formed. Financial resources maybe stretched too thin to meet the need. Caution should be used in starting or rapidly expanding the graduate college, if the resources are not in place to hire the necessary faculty to deliver the program. Should workload issues increase to such a level that productive faculty, who initially rose to the challenge of developing the new graduate research program, leave the institution due to workload, faculty retention problems would result, and would be costly for the
institution. Faculty remaining would be the ones who are less motivated to assist with graduate research education. Such a shift in personnel at WesternU would not be supportive of an environment of excellence, which we are striving to obtain. As we seek to retain and reward motivated faculty, careful consideration should be made regarding course release for prolific researchers and/or those which have a high potential to become prolific. As the graduate program is developed, close attention to faculty workload issues should be monitored, possibly by conducting a yearly survey of the faculty to detect any concerns in workload issues. The information from such a survey should be used to inform decision makers, allowing the results to be considered in future planning and policies formation. Informing faculty of how survey results impact decision-making on planning and workload policies, is also recommended.

**ii) Faculty Research Environment and Faculty Qualifications**

**Best Practices**

According to the Graduate Program Quality Pilot Project by the Center for Measuring University Performance, the "primary driver of quality in research universities comes from research productive faculty", including the “number of tenure track faculty, grant activity of faculty, publications in significant peer reviewed journals, and scholarly book publications where appropriate to the discipline”. A review of the literature reveals that faculty should be:

1. **Capable researchers** who have active research programs, current research funding (NIH or other resources) or potential at securing such funding, and whose research results are published at peer-reviewed journals; who are also inventors and have issued patents or are filing patent applications.
2. **Talented educators** who embrace best practices in teaching, are excellent communicators and facilitators in learning and research processes, are good mentors and nurturers with ability to conduct and train students in inquiry; specifically, who have lectured graduate courses and who have dissertation chair experience or served on dissertation, comprehensive or qualifying examination committee; who have experience at supervising post-doctoral fellows.
3. **Scholarly active scientists** who have been actively involved in writing review articles, comments, and book chapters, organizing symposium or conferences, presenting at major meetings.
4. **Professional and community service participators** who have been members of editorial boards of journals and books, reviewers for journals and grant organizations, and members of local community committees, etc.
5. **Organized administrators** and exemplars of high ethical standards, and
6. **Collaborators** and team players.

For our WesternU study, we measured number of faculty using IPEDS data, and, compared these numbers and faculty student ratios with both realistic and aspirational peers. For grant activity, journal and book publications, we asked faculty to report their activity using a faculty survey.

**Major Findings at WesternU**

The following is based on faculty responses to the survey. Respondents rated the most important attributes for recruiting faculty for a graduate research program to be excellent teaching, capable researcher with grants, publications, and professional activities, in that order. They also ranked faculty characteristics for quality graduate research education to be excellence and honors in teaching, publications, amount of extramural grants, reception by peers as measured by honors and awards, number of citations, involvement in interdisciplinary work, racial/ethnic diversity, and gender diversity, in order.

Overall, faculty responses are positive to campus climate questions. However, they want to be more involved in decision-making/governance and be more respected by administrators. For faculty perspectives on compensation, faculty rate wage increases as not adequate (50%) or poor (28%), while salary and benefits are reasonable. Of particular concern, faculty rated startup funds and non-monetary incentives as insufficient.

The research environment should be improved for faculty members. They need more support as groups of researchers meeting on related topics, more graduate students to assist doing research, more training grants, more office/research lab space, more equipment, and
improved facilities. Half of faculty responded ‘very well’ or ‘excellent’ to campus resources including the library, IT service, and professional development. However, they need more available administrative support staff. The respondents perceive that faculty retention is low and the tenure policy should be more flexible.

Overall, a majority of faculty is interested in conducting research if given release time from teaching, and want to contribute to graduate research education. Faculty members are also potentially qualified for graduate research; a high percentage of earned doctorates indicate significant capacity of graduate research education. Many faculty members have significant numbers of publications, conference presentations, and new grants as a primary or co-investigator in the last few years. Numerous faculty members also have experience as a chair in thesis/dissertation committees or participated as thesis/dissertation committee members. In short, the faculty members are willing to contribute to graduate research education, mentoring students, or conducting research, and many of them are highly qualified.

Recommendations

To create a more supportive environment, a research program should focus on identifying and building a research program that reflects the research mission of the school. With groups of researchers working on similar or related research problems in an interdisciplinary way, it not only strengthens our research quality and productivity but also builds an academic environment that is attractive to future candidates. Strategic hiring also calls for diversity of expertise, as research work can be done on the same theme but can be from different disciplines with different techniques.

The institution should increase our competitiveness in the faculty market. To attract high quality faculty, WesternU needs to have a competitive hiring package, including attractive salary, startup funds, research space, and adequate research equipment. Additionally, the institution should pay attention to faculty retention and the survival of new hires and existing faculty. To keep an institution’s high quality in both education and research, continuity is as important as new hiring, if not more. Additionally, the institution should apply for training grants that will provide fellowship/scholarship for postdoctoral fellows and graduate students to work in the lab with research faculty.

Continuing Challenges and Reflections

WesternU is an emerging institution for biomedical research. As a result, we have challenges to overcome. Unless significant funds are available, new hiring of research faculty is limited by financial resources. The graduate research college can potentially obtain faculty who are well qualified for graduate research education from existing WesternU faculty. However, as previously mentioned about faculty workload, they need available course release time. Currently, 6% of WesternU’s core revenues consist of government or private grants, which is far below our aspirational peers’ portion, which have average 41% of core revenues comprising of government or private grants/gifts. Nevertheless, current research faculty at WesternU consist a “cost-efficient” candidate pool for graduate education and research. With the continuation of intramural support, it is expected that more “teaching” faculty will become teaching/research faculty.

iii) Faculty Numbers

The panel investigated the numbers of faculty compared to students, as compared to realistic peers with graduate health professions. Our student to faculty ratio was 23:1, and realistic peers was 31:1. However, for a select group of aspirational peers conducting significant research, the ratio is 6:1. Therefore, our faculty numbers appear good for realistic peers, but to conduct more research, we should strive to increase faculty numbers. We found one peer with a higher percentage of core revenues from grants and gifts that also had a higher student to faculty ratio.

III. Space and Facility Capacity for Graduate Research Education

Best Practices

Adequate research facilities are required to house research scientists, graduate students, and post-doctoral fellows in order to conduct basic biomedical research programs (Lewis, 1997). Currently, Western University of Health Sciences offers a Masters level program in pharmaceutical sciences with sufficient laboratory space available to accommodate faculty.
members, graduate students and post-doctoral fellows in the laboratory. In order to expand a research program into a university-wide endeavor for interdisciplinary research, WesternU’s facilities also require expansion.

We reviewed ‘peer’ institutions’ website information and explored the amount of space they are expanding for new research facilities. WesternU’s expansion of research lab space seems to be on par with peers, with the exception of larger institutions. All of the institutions with health professional programs mentioned in our web search reported expansion of facilities to house biomedical or scientific research. Likewise, WesternU is expanding biomedical and graduate research. In order to attract federal grants (R01), it is necessary to build the research infrastructure that can accommodate research equipment, lab space, and office space for researchers. In order to add Ph.D. programs on campus, there is a need for expansion of facilities.

Major Findings at WesternU

Based on the projected increase in student enrollment, research faculty using laboratory space, and plans for increased space with new facility construction, there will be a six-fold increase in the amount of research space available in 2009. Additionally, the amount of laboratory space available per faculty member doing research will increase by 250%. According to a research survey for faculty and students in the college of medicine in 2006, 57% felt space constraints were a barrier when doing sponsored research at WesternU. Addressing this concern is critical and facility and space strategic planning has responded to this need. In the faculty survey in August 2007, faculty respondents were asked to rate how well WesternU was doing in its research environment. Forty-five percent of faculty respondents felt research lab space was poor, and 36% felt it was adequate. The remainder felt it was good or excellent. Thirty-three percent felt office space for the research environment was poor.

New facility construction will address these needs for 2009. New research lab space will have to accommodate the space needs of graduate research students and technicians. We project an additional 21 faculty members with lab-based research activity for 2009. Additionally, we anticipate between 1.5 to 3.5 graduate students per research faculty lab for 2009 and beyond, dependent upon the successful recruitment of graduate students to work with faculty researchers. There will be a surplus of lab space based on 1.5 students per faculty member estimates, and a small shortfall of space if the new biomedical graduate research program can recruit 2.5 students per lab.

Recommendations

Based on the review of plans for research space, WesternU will be well situated to meet space needs for laboratory space for new faculty and new graduate students for Fall 2009. Ensuring space allocations for office space and equipment will also be important. Current space for research is not satisfactory, but will greatly improve with the new facilities being built. Unless there is an increase in space allocations in addition to what is projected for 2009, it is recommended that we do not exceed more than 2.5 students per laboratory on average across the institution.

IV. Academic and Strategic Planning Capacity for Graduate Research Education

Best Practices

Academic and strategic planning are necessary first steps for any new program at a college or university. In our initial review of the literature, we found that some institutions, e.g., University of North Texas in Fort Worth, TX, have described their planning process in detail in documents posted on their website; however, most new programs do not provide narratives of how the process was accomplished. Often individuals at the various institutions are willing to discuss their planning process over the telephone, but do not have publicly available documents describing the process. It would appear that this is not a hot topic with reference to academic publishing.

In order to develop the academic and strategic planning for a new program in Graduate Research Education, we 1) interviewed persons on site who were involved in planning of earlier degree programs, and 2) acquired information via internet, conference participation, and telephone on how other institutions have planned their graduate programs, and 3) analyzed information that compared our institution with other similar institutions as well as with institutions that we might like to emulate. We scheduled 30 minute interviews with 6 administrators who had
previous experience and an understanding of the academic and strategic planning process. We reviewed and summarized their comments on a common set of questions about their knowledge of and experience with various elements of the planning process. We met with the principal architect of the graduate research education program at the University of North Texas, Dr. Thomas Yorio.

Major Findings at WesternU

Our major findings were that WesternU has adopted many, if not all, of the elements of effective program planning already. This is perhaps not surprising considering that we have already built 6 accredited academic degree granting programs within the last 30 years, and have a number of others in progress. The strengths of our academic and strategic planning are the experience and knowledge of many individuals among our faculty, staff and administration who have already built new educational programs at this school. Our weakness is the relative lack of experience of many current staff and administrators in designing and planning research based programs. Recognizing this weakness, the administration has recruited a number of new individuals with experience in this area and has established a new position of vice president for research. Another weakness is the lack of funds to sustain graduate research programs in the absence of extramural support. This is a concern because many graduate research programs across the country are expanding and expecting to pursue the same pool of available research funds.

Recommendations

The university should develop the policies and procedures for a new PhD level program early in the planning process. This includes identification of a catalog of courses needed, laboratory configurations, support personnel, etc. The administration should agree to dedicate a minimum level of support to enable appropriate planning and to sustain a core set of personnel who could provide all essential instruction required for the Masters and/or PhD degree.

Continuing Challenges and Reflections

The university may need to reconsider the standard graduate biomedical research education model that assumes a large source of extramural support, specialized laboratories and a smaller student to faculty ratio, with more faculty available. An alternative might be to examine collaborative programs with other graduate programs at local institutions which could provide some of the benefits without all of the costs.

V. Program Review Capacity for Graduate Research Education

Best Practices

Models of evaluation include goals-based evaluation whereby programs examine themselves to determine to what extent they meet pre-determined goals or objectives, assuring adherence to the mission of the institution, and secondly, process-based evaluations, where institutions try to understand how programs produce results. Process-based evaluations are thought to be most useful in long-established organizations that experience frequent complaints and/or inefficiency in delivering programs. Outcomes-based evaluation has gained popularity in recent times because funding sources require that programs meet recognized needs within the community. A survey of best practices reveals the following common elements for self-assessment goals and processes used by successful programs, including good students are retained and attrition rates are minimal, programs hold a prominent place in the institutional mission, programs provide support for students needs such as timely feedback and effective mentoring, programs provide a talented faculty who are capable researchers and educators, institution stimulates learning and creativity and fosters an intellectual environment, institutions provide adequate resources for teaching and research, and faculty conduct quality research that is included in respected publications.

Major Findings at WesternU

Currently, WesternU professional programs are reviewed by peers during scheduled cycles of professional accreditation. Currently, 6 of our 8 programs participate in professional accreditation, with 3 more professionally accredited programs planned for 2009. Graduation and attrition rates for all programs are assessed across the institution, and course and instructor evaluations are also utilized by all programs. The institution currently does not have a structured program review system in place, and two programs are not peer-reviewed or self-reviewed as a result.
Recommendations

For a Graduate College of Biomedical Sciences system of program review, we anticipate each program will establish explicit academic outcomes (a minimum of 4 and a maximum of 10) expected of all graduate students at time of completion of the program. Each of these outcomes will be identified in the program(s)' annual report submissions on an annual basis, integrated into the system of annual reports submitted by each department across the university. For the annual report, the GCBS program(s) will also identify how they intend to measure each outcome, using at least two methods of summative assessment per outcome, with at least one being direct evidence, such as a capstone research project, and another being an indirect method, such as a graduation survey. In addition, any future GCBS programs will establish benchmarks of expected performance they seek students to accomplish. The standards of performance should be based on faculty expectations for graduate disciplinary standards for student's academic work based on rigorous faculty engagement. Every five years, the program(s) will undergo program review, and identify how well they have achieved each of their outcomes across a five-year time span, and report their findings to Academic Affairs, documenting evidence. They should identify both areas for improvement and areas of strength. For subsequent annual reports, they should also indicate what activities they have conducted on an annual basis that demonstrate improvement. In addition, every five years the program(s) will revisit their outcomes to see how well meaningful they continue to be and make any adjustments as necessary, as the biomedical research environment continues to change at a fast pace. Should the programs seek to change their assessment measures or outcomes within a five-year time span, they should propose the changes to Academic Affairs, with a rationale statement, pending approval. In addition, there should be institutional performance indicators that should be measured by GCBS on annual basis, including graduation rates, retention rates, and, for any academic degrees based on research outcomes, graduate student publication and presentation rates at established academic venues.

In addition, there should be a program review council (P.R.C.) established, including key faculty from GCBS, a GCBS Dean, a university administrator, and any identified experts in assessment and evaluation across campus. This P.R.C. will approve the evaluation plans of all G.C.B.S. program outcomes, measurement tools, and establishment of student benchmarks, as well as review and give feedback on the five-year self study. GCBS should also set aside funds to bring in a “peer review” team of at least 3 members from the program’s aspirational peer institutions to provide “external” review and suggestions for improvement, a model similar to our programs that are professionally accredited.

Future Considerations and Challenges

Determining who will oversee the institutional program review process, and how frequently and what programs will participate, is critical, and is likely to be determined by the Quality Assurance Panel. Programs may need to revise their assessment structures to meet university goals, and discussions with those in charge of curriculum and assessment at each of the programs will be a prerequisite for implementation.

VI. Capacity for Student Services for Graduate Research Education

Best Practices

Western University of Health Sciences Office of University Student Affairs (U.S.A.) will assume responsibility for recruitment, admissions, registration, academic support and other related student services for the Graduate College of Biomedical Sciences. U.S.A. is a centralized operations office responsible for enrollment management for the University’s five colleges. Student enrollment at WesternU has increased 48 percent in five years from 1,545 in 2003-2004 to 2,289 in 2007-2008. It is anticipated with the addition of three new health sciences colleges in 2009 (dentistry, optometry and podiatry) and GCBS that student enrollment will increase approximately 12 percent from 2007-2008 to 2009-2010. Our current enrollment is 2,289, and enrollment should reach approximately 2,550 in 2009-2010, with a 3% attrition rate. Our entering class sizes are larger that our graduating classes for programs in physical therapy, osteopathic medicine and pharmacy.

For peer comparison, we included other health sciences universities with similar academic programs, such as A.T. Still University, University of Arizona, Midwestern University,
and the University of North Texas, chosen because we consider them to be competitors and aspirational peers. Next, we reviewed websites of peer institutions. We included a review of other graduate programs in biomedical sciences, and consulted with an expert from the University of North Texas Health Sciences Center, the founder of their College of Biomedical Sciences. In addition, panel member discussion included perspectives from administration, faculty, researchers, librarian and student affairs professionals.

Survey results from an E-Expectations Study of Graduate Level Students (Noel-Levitz, 2007) received more than 1,000 responses from prospective graduate school students asked how they want to hear from universities. The survey results showed a clear preference for electronic communications over print. Given a choice, two out of three respondents preferred the Web over printed material.

Main Findings at WesternU

WesternU employs a full-time Director of University Recruitment and a staff of six full-time University recruiters. Each recruiter is assigned to a specific college or multiple academic programs to manage, and work includes managing prospects, inquiry development, communications to prospective students and applicants, and collaborating with admissions directors, deans and faculty to develop specific strategies for admitting students and retaining them through enrollment. In a review of our peers, we compared scholarship information, financial aid, assistantship opportunities, tuition/fees, length of time to complete program, connections with employers or career services, and detail on faculty.

Our plans for meeting capacity needs include building a Web site and creating brochures that respond to these important decision factors for graduate students. The successful process that currently exists for recruitment and admissions, as evidenced by the enrollment increases to our programs, will be replicated for CGBS. Enrollment management practices and recruitment and admissions strategies are comparable to our peers. Our strengths include WesternU’s experienced team of enrollment management and student services professionals. WesternU has also contracted services of an enrollment management consulting team with a national reputation for their expertise in graduate education, and their recommendations were integrated into this report.

To improve our capacity, we are strengthening our information technology infrastructure to enhance our ability to manage marketing/communication campaigns to attract highly motivated and qualified graduate applicants. Communication plans will be developed to target interested student and managed through Target X, a new marketing communication software package that will be acquired within the next four weeks.

Recommendations

a) Develop an admissions and recruitment process in addition to student services for CGBS using data from institutions that are highly rated and meet the need that this group of students identify in surveys like E-Expectations.

b) Identify unique selling point/points of difference for CGBS and market those to qualified applicants, which will become more evident when the curriculum created.

c) Offer detailed information about CGBS on our Web site and in printed material.

d) Develop a multi-year strategic enrollment plan.

e) Involve research faculty in the student recruitment process.

f) We anticipate that CGBS will attract additional international students, therefore, the development of an Office of International Students and Scholars is also recommended.

g) Strengthen and maintain an IT infrastructure and support to assist student services.

Future Considerations and Challenges

As the University continues to grow and develop into a nationally recognized academic health center with a unique offering of inter-professional education, CGBS has the opportunity to join in this effort through their focus on research. This unique selling point will make WesternU’s CGBS attractive to individuals who are interested in a multi-disciplinary learning environment. Practices recommended are currently in place for existing colleges, and are also being developed specifically for CGBS.
VII. Library Capacity for Graduate Research Education

Best Practices

Since the mission for WesternU has been historically had a teaching focus, the collection development policy for Pumerantz Library has been at a level of collecting to support the curriculum. Having a strong collection at the research level is important to meet research needs of graduate students and researchers. Of the few articles specifically with library support of new academic programs, most articles are on the broader subject of collection development, including for specific disciplines, concentrating on "first purchase" and core collections (Bergen & Nemet, 1999; Hurt, Rein, Connors, Walsh, & Wu, 1995; Schlotzhauer, 2006; Stowers & Galbraith, 2004).

Marlor and Johnson-Corcoran identified three areas—serials, monographs, and online resources—to review when adding a new program (Marlor & Johnson-Corcoran, 2004). Northern Kentucky University (NKU) has established a procedure and form for departments to use when developing new programs. NKU’s procedure includes using ACRL (Association of College & Research Libraries) Standards for Libraries in Higher Education, library software for reports, lists of databases available to students and faculty, and lists of journals (including print & electronic) (Kennedy, 2006). Using these methods, including comparison data from the NCES (National Center for Education Statistics) biennial libraries survey and looking at the collections at peer institutions, Pumerantz Library can determine the strength and weakness of our collection to support biomedical graduate research education. In the ACRL Standards, libraries are encouraged to choose their own peer group for comparison. Some of the suggested points of comparison are ratios of volumes, FTE library staff, circulation, interlibrary loan requests, and reference questions in a sample week, all to combined student and faculty FTE (“Standards for libraries in higher education,” 2004).

For peer comparison, I used the same realistic peers identified in our IPEDS analysis - A. T. Still University of Health Sciences, Des Moines University, Midwestern University (IL), and Midwestern University (AZ). Midwestern University (AZ) did not enter data for the library in the 2004 survey (NCES Library Comparison - Libraries Comparison Report, 2004). Only institutions participating in the NCES survey are included in the analysis.

Major Findings at WesternU

Using NCES data, Western University had an average of 13.37 volumes per student while our peer institutions report an average of 24.30 volumes per student. WesternU had 318 journal subscriptions, with the comparison group median at 591 subscriptions. The number of librarians per 1,000 FTE students is 1.8 for WesternU and a median of 3.17 for our peer group. In a comparison of services, WesternU provided 451 Interlibrary Loans [median was 3,813], 6 circulation transactions per 1,000 FTE [median was 11 transactions per 1,000], and 62 reference transactions in a typical week [median was 25].

Recommendations

An evaluation of Pumerantz Library collection, using criteria from ACRL, NCES comparison data, and evaluation of other libraries collections, shows that we are able to support to the level of a Master’s degree and some research. We will need to strengthen the collection beyond the current level to a research level for more in-depth research and graduate level degrees, particularly in the journal collection. Data from 2004 NCES surveys show that WesternU spends $514 per FTE, 22% less than our peer comparison group. In 2004, WesternU subscribed to 318 journals, 86% fewer than our peer institutions. The university needs to continue to significantly increase budgetary support of the library, ideally over the next five years, so that we will be able to add additional journal titles to the collection (our current subscriptions total 374, still fewer than our peer institutions). Journal publications increase an average of 10% per year in cost. In order to maintain journal holdings, the journal budget needs to increase by 10% per year to maintain current levels of support, assuming journal publications continue to increase in price at the current pace. To accommodate the needs of the GCBS researchers, faculty, and students, the Library will need to increase holdings to the standards indicated in the peer review to close the gap.

Continuing Challenges and Reflections

Western University has a Research Council and a Library Committee whose members suggest journals that should be added to the collection. It is important that the faculty and students take a more active role in recommending journals they think are important to their
studies and faculty research. The cost of journals continues to rise rapidly, making it difficult for us to increase our holdings to the level that we need. As mentioned previously, the average increase is 10% per year, but some publishers are increasing their costs at a much higher rate (135% from one publisher). Pricing models vary from publisher to publisher for electronic content, and some are also changing their pricing models, all of which increases the cost to the university. Another issue of concern to librarians is that publishers are eliminating print only or electronic only subscriptions and moving to print plus online subscriptions for institutions. This puts an additional burden on our limited shelf space for journals, creating a need to find additional space for the collection.

VIII. Conclusions

Based on the major themes investigated by GCBS panel members, we find the university to be in the emerging stage of development in its quest to develop a Graduate College of Biomedical Sciences. Findings also show Western University’s specific areas of strength and weakness. Currently, strengths include our capacity for developing strategic and academic plans for new programs, plans for student recruitment and student and faculty interest in research and research education. Research findings show how the library needs to improve its collections to meet needs of graduate research students and faculty, possible through appropriate resource allocation in the future. Further investigation regarding the various components of student support services is needed. At this time, we do not know what special support services are needed for a learning environment for graduate students beyond what is currently available for our two academic programs and six health professional programs. We recommend student support services specifically geared for the biomedical research graduate student be investigated in more detail in the future. Faculty workloads are currently appropriate for a primarily education-centered function; however, more time for faculty to conduct intensive research is needed. Also, appropriate workload policies need to be developed to allow faculty members involved in graduate research education appropriate time allocations. For example, time allotments can include 40% spent on research activity and 40% on teaching. Developing and instituting workload policies may require time given that our institution is emerging in this area; and, funding will be developed over time. A further challenge to our resource allocations, as IPEDS analysis reveals, is university revenue is more tuition-dependent than our peers. Diversifying institutional revenue sources to include grant-based funding will improve the institution’s fiscal position long-term.

Data regarding space and facilities indicate an area where Western University needs improvement. The institution is currently filled to capacity for available research labs, and there is little space available for recruiting new research faculty. This challenge will be alleviated with some new plans for renovating existing classroom space into flexible research labs, but more substantially by new building construction opening in 2009. This will add 45,000 sq. ft additional research space by 2009. Sufficient research space will then be available to accommodate incoming graduate students working in research labs.

An area of strength includes the qualifications and talents of faculty currently conducting research at the institution. Further development of university faculty who desire to be included in graduate research is needed, however, grant writing abilities and resource opportunities and/or backgrounds to participate in graduate research education may be currently limited. The research environment needs improvement for faculty currently doing research at Western University. Also, once satisfied, improved start-up packages for recruiting highly quality faculty researchers is needed in an effort to offer the best quality education for biomedical graduate students. In general, the institution is well on its way to become a premier biomedical research university.
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