

Western Washington University

Faculty Senate Ad Hoc Committee: Graduate Strategic Advisory Committee

REPORT ON RECOMMENDED CRITERIA FOR EVALUATING NEW AND EXISTING GRADUATE PROGRAMS

May 27, 2011

INTRODUCTION

The Graduate Strategic Advisory Committee (GSAC) was formed collaboratively by the Faculty Senate and the Provost in February 2010. The central charge of the GSAC was to “conduct a strategic examination of graduate education at WWU, and identify the strengths, challenges, opportunities, and threats which confront the development of graduate education at WWU. The GSAC should actively solicit viewpoints from the community of stakeholders. The committee will generate general principles to guide the University in evaluating new and existing programs.”

This GSAC report to the Faculty Senate and Provost focuses on the criteria for evaluating new and existing graduate programs. This brief report includes the following:

1. Introduction
2. Recommended criteria for evaluating new and existing graduate programs
3. Recommendations for future directions in graduate education at WWU
4. Historical context and core assumptions of the GSAC work
5. Sources that informed the committee’s SCOT analysis and recommendations
6. GSAC committee members
7. Appendices:
 - A. SCOT Analysis
 - B. Recommended Graduate Program Review Categories
 - C. GSAC charge from the Faculty Senate and Provost
 - D. External Scan References
 - E. Internal Scan References

RECOMMENDED CRITERIA FOR EVALUATING NEW AND EXISTING GRADUATE PROGRAMS

PREFACE

GSAC has identified a set of five criteria and their indicators to guide the development of new graduate programs and assess the quality of existing graduate programs. The criteria are derived from analyses of: 1) the GSAC environmental scan; 2) the GSAC SCOT analysis; 3) recent surveys of graduate faculty advisors/chairs and graduate students; and 4) numerous university, state, and national research reports, and 5) the expertise of the committee members who have been involved in graduate education.

A variety of strategies and methods can produce positive outcomes in graduate programs. To maximize program quality and provide evidence of that quality, programs need to implement and maintain assessment practices in which faculty regularly collect and analyze data related to the review criteria and adjust programs based on assessment results. Thus, when preparing for a program review, each criterion and its indicators (no order of preference is connoted in the alpha numeric arrangements) must be addressed with quantitative or qualitative evidence. Metrics and forms of evidence may vary by program and are not limited to the examples provided in this document. In turn, this is intended to serve as a guideline for action resulting from reviews of programs.

CRITERIA

Criterion 1. Graduate programs align with the Western Washington University mission and strategic goals.

- a. **Mission.** How do the program, faculty, and graduate students contribute directly to the University's mission?
- b. **Strategic goals.** Specifically, how does the program help further the University's strategic goals?
- c. **Program impact.** For an existing program, how has the program changed over the years to meet or lead social and economic changes in the state of Washington? Overall, what have been substantive contributions of the program to WWU, the state, and the region, and what can be anticipated from the program in the future?

Criterion 2. There is evidence of a need or demand for the graduate program, both externally and internally.

- a. **External demand.** The graduate program meets occupational and economic development needs of the state and region, accommodates societal trends, and is responsive to changing demographics.
- b. **Serves a distinctive need as a niche program.** The program serves a "niche demand", as indicated by insufficient programs in the state or region, emerging trends, innovative design, or special target student population.
- c. **Demand by potential students.** Student demand or interest is indicated by trends in the number of applications, percentage admitted, acceptance rates, yield rates, and the ratio of resident/non-resident applicants.
- d. **Internal university demand.** Internal university demand for a graduate program is primarily driven by i) faculty preference for the benefits of collaborative scholarship that graduate students stimulate, and ii) contributions of graduate students to undergraduate teaching, research, and mentoring.
- e. **Adaptability and accessibility.** Quality graduate programs regularly adapt to changing needs, as appropriate to the discipline and may be open to restructuring or developing interdisciplinary programs. To increase accessibility to students, quality programs may provide alternative means of program delivery, such as distance education, flexible times and locations, and entrepreneurial endeavors.

Criterion 3. Effective graduate programs use robust assessment practices and provide evidence of program and learning outcomes.

- a. **Attainment of learning outcomes.** Students demonstrate expected program learning outcomes (knowledge, skills, and abilities) through outcomes assessments such as successful completion of a thesis, culmination project, professional exam, program comprehensive exam, required internships, or professional portfolio.
- b. **Student achievements.** Student success at program completion indicates a program's quality. Evidence of student success includes, fellowships & awards, scholarly presentations, peer-reviewed publications, job placement in the field of study, performance in professional certifications, acceptance in doctoral programs, and employer satisfaction.
- c. **Graduate students experience service** to the university, community and profession. Program specific examples of service experience of graduate students include: mentoring undergraduates, support of faculty teaching and research, facilitating undergraduate scholarship, and direct professional service to the community and professional organizations.
- d. **Program Efficiency.** Quality programs optimize student pathways to the degree, including research requirements, the number of credits and courses taken, and the number of academic quarters needed to graduate. A high rate of program completion is expected in quality programs.
- e. **Student satisfaction.** Evidence of student satisfaction with their graduate education, such as through post-graduation surveys.

Criterion 4. Fiscal, physical, and personnel resources are sufficient to support an effective graduate program.

- a. **Student support.** The program has adequate support through assistantships, fellowships, scholarships, or paid positions to attract and retain highly capable graduate students.
- b. **Personnel.** The program has an adequate number of qualified faculty and approved instructors who are active in the discipline; they provide the curricular and research depth and breadth necessary for student learning and success to degree achievement. Faculty are able to teach graduate courses and mentor graduate students as part of their normal teaching responsibilities. The necessary professional staff support (e.g. lab, computer and instrumentation technicians) are routinely available and adequate for graduate student research.
- c. **Infrastructure.** Space, instrumentation, technology, and library resources are appropriate to the discipline, and at a minimum are comparable to peer institutions with equal programs.
- d. **Size and productivity of the program.** The program has a sufficient number of graduate students in the program to warrant the effort and resources to sustain it. Indicators of productivity include: the number of graduates per faculty per year, the number of student credit hours generated, graduate student/faculty ratio in the program, and the maximum enrollment capacity given current resources.

- e. **Funding sources.** The amount and diversity of funds are adequate to support program needs. Examples of funding sources are: state funds, grant funds, endowed scholarships, and community partnerships.
- f. **Program costs per student.** Program cost per student is optimized for the expected outcomes and is similar to effective, comparable programs at peer institutions.

Criterion 5. An effective graduate program requires engaged graduate faculty and current relevant curriculum.

- a. **Exceptional, involved graduate faculty.** Faculty are actively involved in scholarship and service to the profession, as indicated by the quantity and quality of recent publications, performances, presentations, and grants; and active professional service at state, regional, and national professional levels.
- b. **Quality curriculum.** The curriculum is current and has breadth, depth and challenge appropriate to the field. It uses current best practices in the discipline and is regularly reviewed to assure continued relevance and excellence.
- c. **Engaged teaching.** Faculty use innovative, best practices in graduate teaching and provide positive student-faculty interactions and mentoring. Faculty have a record of excellence in teaching.
- d. **Inclusive practices.** The graduate program is responsive to differences among prospective and current students. An inclusive program demonstrates broad recruitment and admissions practices, proactive advising, diverse faculty, and student-relevant curriculum.
- e. **Reputation.** The graduate program and its faculty are recognized and respected at regional or national levels. Evidence of a high quality reputation may include recognition of scholarly work of faculty and students, qualification of entering students, national ranking of the program, individual and program awards, accreditation, or quality of program graduates.

RECOMMENDATIONS FOR FUTURE DIRECTIONS IN WWU GRADUATE EDUCATION

1. WWU has a responsibility to increase the number of graduate students. Given WWU's mission, and despite the strong evidence of an external demand for graduate education in Washington and the region, Western has a much smaller proportion of graduate students in the student population than at comparable peer institutions, and the state overall ranks 50th out of the 50 states in graduate level admissions.
2. WWU should strengthen master's programs in STEM fields, professional science, and science education, in response to trends in regional economic development and demands for individuals with graduate preparation in science and technology.
3. Build a culture of assessment in which every graduate program regularly collects and analyzes program assessment data to affirm and strengthen the program.
4. Develop additional graduate program funding strategies, including state funds, Western Foundation, fellowships, grants, self-sustaining, and differential tuition.
5. Provide sufficient time, resources, and compensation for faculty to teach and mentor graduate students, including summer.

6. Increase access to graduate education for nontraditional and traditional students through a variety of means, such as distance education, off-campus sites, alternative time schedules, summer institutes, partnerships with doctoral institutions, and graduate certificate programs.
7. Strongly support the development and coordination of free-standing interdisciplinary graduate programs.
8. Increase annual library resources for print and media collections and personnel to support high quality graduate student and faculty research.
9. Establish a standing committee comprised of graduate faculty, graduate students, a Graduate Council representative, employers, and other external stakeholders. The advisory committee would focus on proactive strategic planning of WWU graduate education so programs remain demonstrably dynamic and responsive to changing opportunities, in accord with the 2009 Graduate Education White Paper.
10. Increase visibility and cohesion of graduate education, with leadership from the President.

HISTORICAL CONTEXT AND CORE ASSUMPTIONS OF THE GSAC WORK

Graduate education has been part of the academic programs of this institution for approximately half of its history. In 1947 the institution was authorized by the Legislature to grant a Master of Education degree, which it did the subsequent year. The 1963 Legislature authorized the development of Master of Arts and Master of Science degrees. The next year, 1964, a Master of Arts and Master of Science in Mathematics and a Master of Arts in History were offered by Western Washington State College. Within three years, graduate degrees were also offered in Economics, English, Geography, Political Science, Psychology, Biology, Chemistry, Geology, and Physics. Currently, there are thirty-five active WWU graduate programs.

In 2009, a committee was charged to conduct a “comprehensive review of the role of graduate programs at Western Washington University.” The outcome of this review was the *White Paper: Committee Report on the Role of Graduate Education at WWU*. The White Paper report and subsequent discussions by faculty, the Faculty Senate, and university administrators suggested that a next step involving an evidence-based strategic focus was needed. A new committee was charged to make specific, strategic recommendations regarding the direction of graduate education, including program evaluation principles or criteria. In April 2010 the Graduate Strategic Advisory Committee held its initial meeting. During the subsequent year, the following three assumptions guided the work of the GSAC committee members:

1. Committee recommendations must be based on information and evidence gathered primarily from a) current internal stakeholders (faculty and students), b) WWU research reports, and c) reports from government agencies or other external academic sources.
2. Decisions of the committee would be made through analysis and discussion of the information and evidence and by means of consensus.
3. The task of GSAC is to make recommendations for program review criteria and indicators that are evidence-based and would guide a) formative evaluations and

b) summative evaluations and decisions, thereby strengthening graduate education.

To carry out its charge, the GSAC used a four-step process:

1. Conduct an environmental scan of external and internal stakeholders of graduate education.
2. Analyze findings from the environmental scans through a SCOT (internal strengths and challenges, and external opportunities and threats) analysis.
3. Develop and recommend criteria and indicators for the evaluation of new and existing graduate programs based on the first two steps.
4. Make other recommendations regarding the future direction of graduate education.

SOURCES THAT INFORMED THE COMMITTEE'S SCOT ANALYSIS AND RECOMMENDATIONS

Recommended criteria for the evaluation of new and existing graduate programs were informed by the following sources of information.

1. As a foundation entry into the scope of graduate education at WWU, each GSAC committee member thoroughly read the June 2009 *White Paper: Committee Report on the Role of Graduate Education at WWU* and regularly discussed and referenced the document in GSAC meetings.
2. The GSAC developed and administered a survey to all current graduate students that included queries about: a) factors that contributed to their decision to pursue a WWU graduate degree, b) the extent to which several factors met their expectations, c) their assessment of the quality of their graduate education to date, d) factors that affected timely progress toward graduation, and e) ways they have been involved with undergraduate students or the community.
3. The GSAC also developed and administered a survey to graduate program advisors and department chairs that included queries about: a) changes needed to reach optimal program size, b) interest in interdisciplinary Master's degrees, c) extent of graduate students' involvement with undergraduates and in the community, d) faculty interest in a doctoral program, and e) response to possible review criteria.
4. All GSAC members individually conducted a component of the *external* environmental scan by gathering information relevant to one external scan factor: education, technology, economics, demographics, geographic, political, social, legal, funding sources, government, and business.
5. All GSAC members individually conducted one component of the *internal* environmental scan by gathering information relevant to an internal scan factor: faculty, current graduate programs, graduate students, institutional policies affecting graduate education, mission and strategic plan, relationship to undergraduate students, structure of graduate programs, fiscal support, and support resources

6. During two committee retreats, GSAC members analyzed information from the external and internal environmental scans and distilled results of the discussion into a succinct SCOT analysis.
7. A robust GSAC Blackboard site with information related to all the above was used throughout the process and served as a source of common information for the committee to discuss.
8. At weekly or biweekly GSAC meetings over four quarters, committee members collaboratively and professionally discussed a multitude of information with the goal of sustaining and advancing the quality of graduate education at WWU.

GSAC COMMITTEE MEMBERS

Janet Finlay	CHSS Governing Council
Gabe Gossett	Library
Pamela Hall	CBE Governing Council
David Hooper	CST Governing Council
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Steve Vanderstaay*	Vice Provost Undergraduate Education
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APPENDIX A

GSAC SCOT ANALYSIS OF GRADUATE EDUCATION BASED ON THE INTERNAL AND EXTERNAL ENVIRONMENTAL SCANS

STRENGTHS

1. Students report a high level of satisfaction with their graduate program – 81% of graduates were satisfied or highly satisfied overall. Areas of highest satisfaction are: quality of faculty instruction, faculty keeping pace with recent trends, small classes, level of academic challenge, and low cost. There is particularly high satisfaction with professional programs.
2. Students communicate a feeling of cohesion and peer collaboration in their programs.
3. WWU graduate programs provide excellent access to students of color. A high and fairly consistent percentage of graduate students of color (24%) matches the overall ethnic diversity of individuals residing in Washington.
4. Graduate education aligns well with WWU's foremost guiding documents: mission, vision, values, and strategic goals.
5. Graduate programs capitalize on Bellingham's geographic location in terms of the natural environment, economic, social and political landscape.
6. Graduate students actively engage in out-of-class academic experiences related to their graduate program. Depending on the program, typically 50% - 100% of students attend a regional or national conference or meeting related to their academic study.
7. Contributing to high quality graduate programs is the distinguished quality of WWU undergraduate programs that feed high caliber, well-prepared students into the institution's graduate programs.
8. Low graduate tuition rates attract students to the institution.
9. Some programs have facilities that are well matched to their graduate programs and serve as models, e.g., Neuroscience and Shannon Point.
10. There is mutual support between the community and professional and applied programs.
11. Students completing graduate programs are highly employable. In the past two years, 84% - 87% were employed three months after graduating, and an additional 7% were pursuing further graduate education.
12. Strong graduate programs attract and keep quality faculty.
13. Graduate programs foster scholarly and creative activity by faculty, graduate students, and undergraduate students.
14. Fairly high student completion rates, combined with good rates of student time-to-degree, indicate good efficiency in graduate programs.

CHALLENGES

1. There are few, if any, department policies, procedures, faculty incentives, and culture for initiating creative funding alternatives, per the EESP White Paper.
2. There are untapped opportunities for departments to expand programs to meet community and regional needs by offering graduate certificate programs, post-baccalaureate programs, multi-disciplinary graduate programs, and graduate level extended education programs.
3. Faculty have expert knowledge that is not fully utilized, so faculty could be tapped to expand or create new graduate programs in different areas.
4. Graduate students are concerned with support resources: facilities, equipment, space, and library.
5. There are limited course offerings at the 500 level, resulting in a large number of stacked courses.
6. Graduate students report a sense of invisibility and isolation on campus; they have little presence or interaction beyond their single graduate program.
7. Very minimal WWU Foundation effort and support is directed toward graduate education, because the foundation focuses almost solely on fund development for undergraduate students and programs.
8. Students consistently report low satisfaction with advising, support for transitioning to their graduate program, and clarity about graduate level performance expectations.
9. There has been a decline in the number of graduate programs and the number of graduate students. There is also a trend toward an increased percentage of part-time graduate students.
10. WWU has a significantly lower percentage of its total student enrollment in graduate education versus undergraduate education as compared to designated peer institutions.
11. Across programs the size, focus, support, and direction of graduate education have been largely influenced by the need for TAs for selected large lower division undergraduate courses.
12. Lack of adequate financial support for graduate students is the most common shortfall reported by faculty. Summer student funding is a particular challenge in some programs.
13. Some graduate program facilities that are not sufficiently robust to match program needs.
14. Faculty have identified a gap between current program sizes and capacity to accept students in their programs, given the current number of faculty, however, faculty workload issues, particularly tradeoffs between effort directed toward undergraduate versus graduate teaching, are a constraint on reducing that gap.
15. Potential growth and shifting of graduate programs requires creative and strategic thinking about future directions and collaborative endeavors, such as interdisciplinary graduate programs, partnerships with the local or regional community, etc. There is no governing body within the University charged with proactive strategic planning of graduate education.

OPPORTUNITIES

1. Long-term occupational projections indicate large existing market and growth in jobs areas with requirements for high-level education, nationally and in the Pacific Northwest and Washington.
2. Employers need Master's prepared employees. In 2010, 22% of Washington employers reported difficulty in recruiting applicants at the Master's level. Projected 17% increase in professional occupations compared to 10% increase in overall occupations (2008-18), so there is an increasing demand.
3. There is a need for strategic matches of programs to high growth and high demand fields in the State. Particular fields have substantial unmet needs in Washington: Engineering, health, computer science, human/protective services.
4. There is high demand but low access to graduate education. Washington ranks 48th out of 50 states in available slots for higher education but 50th in graduate level slots.
5. Both employers and students believe that a graduate education will enhance economic innovation and social prosperity.
6. The world is changing, so colleges can generate new ideas in new fields, particularly through partnerships between academia and private and public sectors.
7. Master's degrees are critical to STEM (science, technology, engineering, math) fields: Thirty percent of all scientists and engineers have Master's degrees. Sixty percent of all science and engineering graduates with Master's degrees were employed in business and industry, 12% were in government, and 8% worked in 4-year colleges and universities.
8. A Master's degree may be seen by the population at large as a new minimum education standard in some fields. There is a significant growth of Master's degrees awarded and a parallel growth of baccalaureate degrees, while Doctorates awarded remains relatively flat since 2005.
9. The demographic that leads the growth in graduate degree applications are individuals from underrepresented racial and ethnic groups and women.
10. There are increased interests in graduate level programs by international students, particularly in science and technology.
11. Often individuals with professional science Master's degrees meet employers' needs as well as a doctorate, yet the former is more cost effective for colleges and employers.
12. Marked advantages of Master's degree: cost effective for students as compared to pursuing lengthy doctorate, substantial increase in completion rate of Ph.D. if first have a Master's degree, significant increase in income and higher employment rate compared to earning an undergraduate degree, and higher lifetime individual health.
13. Master's degrees are the preferred graduate degree: Nationally 90% of all graduate degrees are Master's degrees (2006-07); Master's Universities (which is WWU Carnegie classification) offer 38% of all Master's degrees (Bell 2008)
14. Demand for teachers with Master's in science education. NAS says this would contribute to the greatest transformation in k-12 education in 50 years.
15. Emerging niche STEM Ph.D. programs form partnerships between Master's degree institutions and regional doctoral universities.

THREATS

1. There has been a trend in decreased State financial support for higher education, and this threatens initiatives that could take advantage of potential opportunities. The State has decreased investment per student and in capital projects at comprehensive universities.
2. The State legislature hears competing requests for funding, and some sectors of higher education, such as community colleges, make more successful funding requests for more easily understood programs relevant to State workforce needs. The six public universities in the State educate approximately 41% of Washington students in higher education as compared to the 34 community colleges that educate 59% of college students. Also, they are present in every legislative district.
3. In Washington and nationally, there is a rapid increase in graduate programs offered at times and locations convenient to citizens through access at branch campuses, off-campus sites, and through on-line/distance education delivery. There is usually a well-developed infrastructure to support such programs.
4. The University of Washington and other institutions offer fee-based professional Master's degrees, which is a growing trend given a decline in state funding.
5. The national and state trend toward increased expectations for accountability, effectiveness, and efficiency demands relevant performance outcome data and planning.
6. Low salaries (47 percentile), inadequate start-up funds, and minimal summer salaries compared to the competition can be a barrier to attracting graduate faculty.
7. Increased competition for assistantship funding from grants leads to decreased assistantships to attract talented students.
8. The lack of adequate access to graduate education in the State is forcing the demand for increased master's degrees to be met out-of-state.
9. State four-year colleges and universities usually cannot adapt as quickly to needs for high demand programs as for-profit institutions and community colleges.
10. There is a net immigration of people into Washington projected at 5.5% per year through 2030, and they will require education. Given the growth trends of Master's programs, it is probable that this population will increase the need to be served at this educational level.

APPENDIX B

RECOMMENDED GRADUATE PROGRAM REVIEW CATEGORIES

While the primary focus of the GSAC committee charge was to recommend principles/criteria for the evaluation of new and existing graduate programs, the charge also invited further recommendations that the committee deemed relevant. The program evaluation criteria were developed by GSAC in context of guiding on-going graduate program reviews. However, in the pending process of conducting expedient graduate program evaluations, the criteria could be used to make dichotomous decisions to either keep or eliminate a program. An alternative framework is to evaluate graduate programs in the context of a range of actions, such as those listed below.

1. Enhance

Programs assigned to this category generally receive high overall program review scores. Investment in these programs should be a priority to strengthen the academic performance of the university.

2. Maintain

Programs assigned to this category generally receive medium to high overall program review scores. Continued support of these programs, at or near their current resource allocation, is central to maintaining the academic performance of the university.

3. Re-review

Programs assigned to this category generally receive medium to low program review scores. Programs in this category contribute to the academic breadth of the university, but curricular reorganization and/or expenditure reduction is required for long-term viability and acceptable levels of contribution by these programs. A careful review of these programs should be conducted within two years.

4. Restructure

Programs assigned to this category generally receive low program scores. Restructuring or eliminating these programs will permit the redistribution of resources to other targeted programs and will enhance the academic performance of the university.

5. Incipient

Programs assigned to this category have been recently developed or substantially restructured and therefore could not be adequately assessed at this time. The programs have potential to contribute to the academic performance of the university. A careful review of these programs should be conducted within the next two to three years.

APPENDIX C

GRADUATE STRATEGIC ADVISORY COMMITTEE CHARGE FROM THE FACULTY SENATE AND PROVOST

The GSAC will conduct a strategic examination of graduate education at WWU, and identify the strengths, challenges, opportunities, and threats which confront the development of graduate education at WWU. The GSAC should actively solicit viewpoints from the community of stakeholders.

The committee will generate general principles to guide the University in evaluating new and existing programs. The committee will make recommendations jointly to the Senate and the Provost, concerning the adoption of these principles, and concerning changes in degree types or levels, or other directions for graduate study in which the committee believes the University should move. The committee will not approve proposed programs or evaluate existing ones. These remain functions of the Graduate Council, the ACC, and the Senate. The Senate will forward any recommendations from the GSAC to the Graduate Council, ACC, UPRC and the Deans, and publish them on the Senate's and the Provost's website. Any action on the GSAC recommendations remains the responsibility of the existing governance structure.

APPENDIX D

EXTERNAL SCAN REFERENCES

- Appalachian State University. *Peace Corps master's international (MI) programs*. GSAC Website. Western Washington University: Bellingham, WA.
- American Science and Technology, National Academy of Sciences, National Academy of Engineering, & Institute of Medicine. (2007). *Rising above the gathering storm: Energizing and employing America for a brighter economic future*. *Committee on Prospering in the Global Economy of the 21st Century*. National Academies Press: Washington, D.C.
- Association of American Universities. (2010). *Funding levels of major fellowship and traineeship, graduate education and postdoctoral programs in the federal government FY 2010*.
- Association of American Universities. (2008). *Facts and Figures*.
- Berdahl, R.M. (2008). *Research universities addressing the issues of the 21st century*. Association of American Universities.
- Berdahl, R.M. (2009). *Renewing the partnership: Thoughts on the current status of American universities. A presentation to the National Academy's Board on higher education and work force*. Association of American Universities.
- BLS Current Population Survey. *Labor Force Statistics*. Retrieved from <http://www.bls.gov/cps/demographics.htm#education>
- Center for Innovation and Research in Graduate Education. Retrieved from <http://depts.washington.edu/cirgeweb/c/research/innovative-graduate-programs-igerts/>
- College Enrollment and Work Activity of 2009 High School Graduates. Retrieved from http://www.bls.gov/news.release/archives/hsgec_04272010.pdf
- Elenich, R., Greenlee, D., Hughes, A., Laajala, S., Predebon, B., Pregitzer, K., Reed, D., & Vogler, M. (2005). *Review of undergraduate and graduate program costs and revenues*. Michigan Technological University.
- Examples of master's degrees offered on-line by accredited institutions*. GSAC Website: Bellingham, WA.
- Ghali, M.A. (2010). *Can the M.S. degree increase STEM Ph.D. completion rates and increase diversity? Importance of MA and MS education for Ph.D. completion rates report*. Western Washington University.

- Ghali, M.A. (2011). *Graduate Enrollment at MS Institutions*. Western Washington University.
- Golde, C.M. (no date). *Preparing stewards of the discipline*. Re-envisioning Higher Education.
- Landis, W. (2011). *Masters Level Support Programs*. GSAC Website. Western Washington University, WA
- Lederer, J. (2010). *Job growth: Why increasing educational attainment is so important for creating jobs*. Washington Higher Education Coordinating Board.
- Metro Economic Outlook Seattle. Retrieved from <http://www.shrm.org/Research/MonthlyEmploymentIndices/Documents/seattle.pdf>
- National Center for Education Statistics. (2008). *Status and Trends in the Education of American Indians and Alaska Natives*. Retrieved from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2008084>
- National Center for Education Statistics. (2009). *Projection of Education Statistics to 2018*. Retrieved from <http://nces.ed.gov/programs/projections/projections2018/index.asp>
- National Center for Education Statistics. (2010). *The condition of education 2010*. Institute of Education Sciences.
- National Center for Education Statistics. (2011). *Trends in student financing of graduate and first-professional education: Selected years, 1995-96 to 2007-08*. Institute of Education Sciences.
- National Research Council & National Public Administration. (2010). *Choosing the nation's fiscal future*. National Academies Press. Washington, D.C.
- National Science Foundation. *Support of interdisciplinary education and research*. Retrieved from http://www.nsf.gov/od/oia/additional_resources/interdisciplinary_research/
- NGA Center for Best Practices. (2006). *The professional science master's degree: Meeting the skills needs of innovative industries*. Retrieved from: http://www.sciencemasters.com/portals/0/Speaker/NGA_Issue_Brief.pdf
- Snyder, T.D., & Dillow, S.A. (2010). *Digest of education statistics 2009*. Institute of Education Sciences: National Center for Education Statistics.
- Spaulding, R. (2010). *The impact of interstate migration on human capital development in Washington*. Washington Higher Education Coordinating Board.

- Stewart, D.W. (February, 2010). *America's future prosperity*. *Change Magazine*.
- The Leadership Council. (2008). *The benefits of higher education*. The Advisory Board Company. Washington, D.C.
- U.S. Bureau of Labor Statistics. *Job prospects for those with postsecondary education 2008-2018*. GSAC Website. Western Washington University: Bellingham, WA.
- U.S. Bureau of Labor Statistics. *Thirty-fastest growing occupations, 2008-18*. GSAC Website. Western Washington University: Bellingham, WA.
- U.S. Bureau of Labor Statistics. (2009). *Employment by major occupational group, 2008 and projected 2018*. GSAC Website. Western Washington University: Bellingham, WA.
- Walker, G.E., Golde, C.M., Jones, L., Bueschel, A.C., & Hutchings, P. (2007). *The formation of scholars: Rethinking doctoral education for the twenty-first century*. The Carnegie Foundation for the Advancement of Teaching.
- Washington Higher Education Coordinating Board. (March, 2011). Transfer report. Retrieved from www.hecb.wa.gov/reports. Retrieved from www.hecb.wa.gov/publications
- Washington Higher Education Coordinating Board. (2011). *Regional needs analysis report*. Retrieved from www.hecb.wa.gov/reports
- Washington Higher Education Coordinating Board. (September, 2010). *The impact of interstate migration on human capital development in Washington*. Retrieved from www.hecb.wa.gov/reports
- Washington Higher Education Coordinating Board, State Board for Community and Technical Colleges, & Workforce Training and Coordinating Board. (March, 2009). *A skilled and Educated Workforce: An assessment of the number and type of higher education and training credentials required to meet employer demand*. Retrieved from www.hecb.wa.gov/reports
- Washington's State Office of Financial Management. (2009). *Forecast of Washington State population through 2030*. Retrieved from <http://www.ofm.wa.gov/pop/stfc/stfc2009/stfc2009.pdf>
- Washington State Office of Financial Management. (2009). *Higher education trends and highlights: State-funded enrollment in Washington's public higher education system*. Retrieved from www.hecb.wa.gov/reports

- Washington Higher Education Coordinating Board. (Fall, 2008). *Key facts about higher education in Washington*. Retrieved from www.hecb.wa.gov/reports
- Washington Higher Education Coordinating Board. (2007). *2008 Strategic master plan for higher education in Washington: Moving the blue arrow pathways to educational opportunity*. Retrieved from www.hecb.wa.gov/reports
- Washington State Workforce Training and Washington State Education Coordinating Board. (2010). *2010 Employer survey results*. Retrieved from www.hecb.wa.gov/reports
- Wendler, C., Bridgeman, B., Cline, F., Millet, C., Rock, J., Bell, N. & McAllister, P. (2010). *The path forward: The future of graduate education in the United States*. Commission on the Future of Graduate Education in the United States. Council of Graduate Schools, Educational Testing Service.
- Western Washington University. (March 1, 2011). *Year one self-evaluation report*. Western Washington University provost's office. Bellingham, WA.
- Van Boer, B. (2011). *State of Washington population growth trends*. GSAC Website. Western Washington University: Bellingham, WA.

APPENDIX E

INTERNAL SCAN REFERENCES

- Association of Research Libraries. (2010). *LibQual 2010 Survey*. WWU.
- Barr, M., Clark, L., Hartsoch, B., & Krieg, J.M. (2009). *Exit Survey of Graduate Students Completing Degrees in the Spring or Summer of 2009: Descriptive Statistics*. Office of Survey Research, WWU.
- Ghali, M. (no date). *Graduate Student Enrollment in Master's Institutions*.
- Halgren, F. (2009). *Graduate Student Satisfaction Survey Conducted May 2009*. The Western Libraries, WWU.
- Hartsoch, B., Clark, L., Krieg, J., McKinney, G.R., & Trimble, J.E. (2009). *Western Washington University 2008 Survey of Alumni who Graduated Between Summer, 2006, and Spring, 2007: Technical Report*. Office of Survey Research, WWU.
- Krieg, J., Hartsoch, B., Clark, L., Fosheim, G., & Barr, M. (2010). *2010 Exit Survey of Graduate Students Completing Degrees Fall 2009, Winter 2010, Spring 2010, and Summer 2010: Descriptive Statistics*. Office of Survey Research, WWU.
- Krieg, J., Hartsoch, B., Clark, L., Fosheim, G., & Barr, M. (2010). *2010 Exit Survey of Graduate Students Completing Degrees Fall 2009, Winter 2010, Spring 2010, and Summer 2010 Addendum: Descriptive Statistics*. Office of Survey Research, WWU.
- GSAC members. (February, 2011). *Fiscal Aspects of WWU Graduate Education Meeting Notes*. Western Washington University: Bellingham, WA.
- Office of Institutional Assessment and Testing. (1994). *The Master's Degree Program at Western: A Follow-up Survey of the Masters Class of 1993*. Western Washington University: Bellingham, WA.
- Robinson, L. (2011). *Themes from Five-Year Reviews of Graduate Programs at WWU*. Western Washington University: Bellingham, WA.
- Western Washington University (WWU) Strategic Plan*. The President's Office.
http://www.wwu.edu/president/action_plan.shtml
- WWU Graduate School. (2011). *Dean Ghali's Anticipated TA Allocation Needs for 2011-2012*. Western Washington University: Bellingham, WA.

WWU Graduate School. (no date). *Diversity in Graduate Enrollment*. Western Washington University: Bellingham, WA.

WWU Graduate School. (no date). *Master's Degree Completion Rates and Time to Degree over 4 Years*. Western Washington University: Bellingham, WA.

WWU Graduate School (no date). *Fall 2010 Graduate Student Registration- Residents v. Non-Residents*. Western Washington University: Bellingham, WA.