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ABSTRACT

This report on graduate education, requested by the Virginia General Assembly, was developed by a task force that included graduate students, faculty, and administrators. The task force based its work on a previous report issued by an advisory committee of chief academic officers, a review of recent literature on graduate education, and their own reflections. Three broad principles of rationality, equity, and accountability govern the recommendations. In light of the current fiscal climate the recommendations are divided into those that can be implemented with minimal new investment and those that involve reallocation of resources and/or longer time requirements. The recommendations are grouped in three main areas: (1) attracting good students, (2) financial accessibility, and (3) facilitating student progress through graduate school. The report suggests tasks for departments, provosts, and the state government to attract good students that include adjustments to admission processes, development of articulation agreements, and maintenance of competitive faculty salaries. The report also recommends steps for various groups to increase financial accessibility. These include review of tuition and fees policy, review of need for discretionary-aid appropriations, and giving priority to those that invest in new teaching technologies. Recommendations to various parties for facilitating student progress include welcoming "non-traditional students," clarification and monitoring of student advising, monitoring of time-lines and degree expectations, and other functions. (Contains 13 references.) (JB)

REPORT OF THE
STATE COUNCIL OF HIGHER EDUCATION

GRADUATE EDUCATION

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

James Monroe Building
101 North Fourteenth Street
Richmond, Virginia 23219

September 1993

PREFACE

This study is based on a previous report prepared by the Instructional Programs Advisory Committee, the Council's advisory committee of chief academic officers in Virginia's public colleges and universities. The main contributors to that report were Margaret A. Miller, Associate Director of the State Council of Higher Education; Clara R. Lovett, then provost of George Mason University and now at the American Association for Higher Education; and J. Christopher Bill, then an interim academic coordinator at the Council and now at Mary Washington College. Other contributors were E. Fred Carlisle, Virginia Polytechnic Institute and State University; Shirley L. Menaker, University of Virginia; Hugh P. Kelly, then of the University of Virginia, now deceased; Myron S. Henry, then of Old Dominion University, now at Kent State University; Charles W. Owens, Radford University; Charles P. Ruch, then at Virginia Commonwealth University and now at Boise State University; and Donald C. Stuart, III, Longwood College. The study further makes use of material provided by Gary R. Hooper, then at Virginia Polytechnic Institute and now at Brigham Young University, and reactions provided by Paul T. Bryant of Radford University.

The 1993 General Assembly budget item requesting this study suggested that the Council solicit input from faculty, students, and others interested in graduate education. Accordingly, the Council staff assembled a task force to advise it and provide substantial contributions to the study. Its members are listed below.

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State Council of Higher Education for Virginia

GRADUATE EDUCATION

EXECUTIVE SUMMARY

Graduate education is an important component of the missions of Virginia's four-year public colleges and universities. Graduate students make many contributions to the immediate well-being of the academic communities of which they are a part, for instance by teaching and doing research. More important, they contribute to the larger well-being of the state, many becoming educators and advanced practitioners in their professions. Virginia will need increasing numbers of such well-educated workers in the coming decades. An important social and higher-education goal, then, is to encourage students to pursue graduate studies and to facilitate their progress once they have entered graduate school.

At the behest of the General Assembly, Council of Higher Education staff compiled this report with the help of a task force comprised of graduate students, faculty, and administrators. The task force based its work on a previous report issued by the advisory committee of chief academic officers, the Instructional Programs Advisory Committee (IPAC); a review of recent literature on graduate education; and their own reflections. Its recommendations, made both to institutional and state-level decision-makers, represent a composite of the perspectives of its members.

Three broad principles govern those recommendations. The first is rationality: both campus and state officials should act so as to achieve the goals of attracting good students into graduate education, increasing graduate programs' effectiveness and efficiency in addressing student needs, and facilitating students' successful completion of graduate education. The second is equity: students should be treated fairly, and graduate schools should be welcoming environments for qualified graduate students of all sorts. The final principle is accountability: institutions need to demonstrate that their programs are designed to fulfill their responsibilities to students and to the public. Many graduate programs now behave fully or in part according to these principles; all should do so fully.

The task force also recognizes that in the present fiscal climate, recommendations that involve significant allocation or reallocation of resources, both of time and of money, need to be made with caution. Consequently it has divided the following recommendations into two categories: those that can be implemented with minimal new investment and those that, while in the task force's view are important to high-quality graduate education, may involve some reallocation of resources and therefore have to be implemented over time or deferred. Recommendations that fall in the first category are marked with round bullets and those in the second are preceded by asterisks.

I. To attract good students into graduate school, departments should

- adjust admissions to the extent that graduates have found permanent, program-related employment.
- when necessary, redesign undergraduate majors to attract students to those fields in which increasing numbers of educators and advanced practitioners will be needed;
- reward faculty for good undergraduate academic advising, especially that which encourages interested minority and women students to pursue their education in areas where they are underrepresented; and
- provide more research and teaching opportunities for undergraduates.

Provosts should

- develop articulation agreements, wherever possible, between doctoral and master's programs, especially those at the historically black universities; and, to enhance the attractiveness of academic careers,
- promote a climate of civil discourse among faculty on campus.

The Governor and General Assembly should, to help make academic careers attractive,

- keep faculty salaries competitive.

II. To make graduate education financially accessible, department heads and graduate deans should

- periodically review their policies on tuition, fellowships, and assistantships, in light of prevailing tax laws, to make sure that their financial awards are competitive;
- provide graduate teaching assistantships to programs, subject to three criteria: graduate students' need for apprenticeships, their need to progress steadily toward the degree, and the appropriate proportion of undergraduate courses that should be taught by graduate students;
- give priority to funding matriculated students adequately to enable them to progress steadily toward the degree rather than to increasing the total number of students;
- differentiate among financial incentives offered to students by the need for educators and advanced practitioners in each field, potential salary, and other sources of support;
- develop budget addenda requests that provide justification for additional graduate financial aid that may be needed;
- use tuition increases, in part, to increase graduate financial aid and develop other strategies to reallocate money for this purpose;
- continue to raise private funds for the Virginia Graduate and

Undergraduate Assistance Program; and

- help fund student research not supported through grants or contracts.

Additionally, the Council of Higher education should

- ascertain the need for further discretionary-aid appropriations by analyzing student-specific data, institutional budget requests for such aid, and other factors that determine the need for graduate aid.

Finally, the General Assembly is encouraged to

- give priority to those that invest in new teaching technologies when funding initiatives related to the University of the 21st Century.
- request that the Department of Planning and Budget explore the feasibility of a state-wide pool for graduate student health insurance.
- base salary increases for graduate assistants on the same system of peer institutions used for full-time faculty; and
- more fully fund the Virginia Graduate and Undergraduate Assistance Program.

III. To facilitate student progress through graduate school, institutions should

- welcome "non-traditional" students by adjusting, as appropriate, criteria, curricula, instructional delivery, residency requirements, and schedules for classes, advising, and support services to their needs;
- keep track of the learning, satisfaction, and progress of students in these and all other graduate programs; and
- provide students with the support services necessary to successful progression through their programs.

In addition, each program should

- undergo regular program review, taking into consideration the changing shapes of knowledge and instructional delivery;
- develop ways to recognize outstanding teaching and research on the part of graduate students;
- develop clearly specified objectives, incentives, and timelines for the completion of program requirements;
- review its dissertation policies to determine if they are reasonable and clearly communicated to students
- monitor, support, and reward graduate advising;
- monitor student progress towards the degree and determine and correct when possible the factors that delay degree completion;
- publish standards for the rate at which full- and part-time students are

expected to progress toward the degree;

- inform students in their letters of acceptance about the amounts, terms, and conditions of any financial support; and
- publish a brochure that fully informs prospective and in-coming students about the program and job prospects upon graduation.

THE IMPORTANCE OF GRADUATE EDUCATION

In recent years, the Council of Higher Education has focused its attention primarily on undergraduate education. However, graduate education is also part of the total mission of almost all of Virginia's four-year colleges and universities and merits consideration. Graduate degrees constitute about 19 percent of all degrees granted at Virginia's public colleges and universities. Discussions of graduate education often focus on doctoral programs, but master's programs are a larger and, nationally, the fastest-growing segment of graduate study. About 80 percent of the approximately 30,000 graduate students in Virginia are at the master's level. Across the United States, in 1960 there were seven times as many master's as doctoral degrees awarded; by 1990, there were nine times as many. Partly for this reason, Clifton Conrad has dubbed the master's degree the "silent success" of the American higher education system (1). Only in the unusual growth of its doctoral programs has Virginia deviated from this pattern. Over the past 20 years, while baccalaureate graduates have increased by 86 percent (from 12,337 to 22,911), master's graduates have increased by 91 percent (from 3,568 to 6,819) and doctoral recipients by 177 percent (from 337 to 933).

The Contributions of Graduate Education

Graduate students make important contributions to the missions of institutions of which they are a part. Besides increasing the diversity of the student population and providing an enriched learning environment for all students, many have teaching or research responsibilities. Students with teaching assistantships have responsibilities that may include preparing for the class they are helping to teach; conducting laboratory and discussion sessions; constructing examinations, cases, and homework exercises; grading students' work; and, at times, teaching the class itself.

Graduate students' contribution to research is also significant. Students supported by research assistantships help faculty in research activities. Certain research assistantships are funded through grants obtained by faculty, with the duties of the student specified in the grant. Other research assistantships are funded by the university or department to assist faculty in their own, non-sponsored research activities. With both types of assistantships, students write reports, analyze data, conduct lab experiments, write research proposals, and perform the myriad chores associated with research projects.

Besides their help in addressing problems of social and economic importance such as drug abuse and biotechnology, graduate students' research has more direct economic effects. When it studied the role of graduate students in research in 1990, Virginia Tech discovered that 44 percent of its $50 million worth of sponsored research grants contained stipends for graduate students, for a total of $2 million (1-3). Without good graduate students to work on their projects, faculty members are less competitive for such grants. Consequently, the availability of such students influences a university's

capacity to attract top researchers to its faculty. Failure to do so can lead not only to a diminution of the research reputation of the institution but to further depletion of its sponsored-grants revenue.

More important than the immediate contributions of graduate students, however, are the ways in which graduate education serves both students and the wider society. In deciding on policies and practices relating to graduate education, these considerations must always take precedence over ones of institutional convenience. In this larger context, graduate studies have two primary ends: to educate the educators of succeeding generations and to produce sophisticated practitioners. Both of these goals are present in both master's and doctoral education.

Master's programs are of two sorts. The first is academic: Master of Arts (M.A.) or Master of Sciences (M.S.) programs are usually research oriented and usually prepare students to teach at the primary, secondary, and two-year college level or to proceed with further graduate study. The second type of master's is the professional degree, which generally prepares students to become advanced practitioners in a variety of professional fields. The variety of degree titles -- Master of Education (M.Ed.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Fine Arts (M.F.A.), Master of Social Work (M.S.W.), etc. -- suggests the range of professions for which the degree prepares students. In practice the distinction between the two types of master's degrees is not always clear. Many students seek the academic master's as an entree into professions that lack the formalized structure associated with professional master's programs or as their ticket to advancement within professions. As general expectations for professional competency have risen, disciplines from veterinary medicine to public relations to horticulture have turned to master's programs to provide the skills and knowledge necessary for beginning or advanced work in the field. Such programs often replace the traditional research thesis with a professional paper or practicum.

Although doctoral programs have traditionally had the primary function of producing the next generation of faculty for four-year colleges and universities, increasingly doctoral students too enter or reenter the professions as advanced practitioners. Between 1968 and 1988, the number of new Ph.D.s employed outside academia rose from 33 to over 50 percent (California 9), with considerable variation depending on field.

The Need for Faculty

Attention given to graduate education recently has focused on the traditional responsibility of doctoral programs to produce faculty. This focus results from concern about whether institutions can produce enough doctoral graduates to meet an increasing need for faculty generated by faculty retirements and projected increases in student enrollment. This concern extends to master's education as well, since two-year colleges employ faculty trained at the master's level. In their 1989 study of national arts-and-

sciences faculty shortages at four-year institutions, William Bowen and Julie Ann Sosa predicted that by the year 2002, over half of existing arts and sciences faculty will have left the academy. In Virginia, 21 percent of all faculty is over the age of 55. Even after the lifting of mandatory faculty retirement four years ago in Virginia, faculty continue to retire at about the same ages they always have. Presuming, then, an average retirement age of about 65, a substantial number of faculty members should be lost to retirement alone by the turn of the century.

Faculty age varies by discipline: only 11 percent of computer science faculty but about one-quarter of the faculty members in the physical sciences and engineering in Virginia are over the age of 55. It also varies by type of institution and, what is more important, by the type of training needed. For instance, 19 percent of foreign language faculty in the four-year institutions in Virginia, which generally require that their faculty have doctoral degrees, are over 55. But 30 percent of foreign language faculty in the two-year institutions, which require faculty to have master's-level education, are in this age range. Table 1 lists in descending order the number of faculty members who might be expected to retire in the next decade by discipline and institutional type.

Table 1
Percent of Instructional Faculty Over Age 55
Virginia Public Colleges and Universities

Four-Year Institutions		Two-Year Institutions	
Discipline	% 55+	Discipline	% 55+
Physical Sciences	28.8	Psychology	30.5
Education	27.7	Foreign Languages	30.0
Biological Sciences	25.5	Physical Sciences	29.0
Arch. & Environmental Design	23.4	Engineering	28.6
Letters	23.1	Business & Commerce Tech	26.1
Public Affairs	23.1	Mech. & Engineering Tech.	23.2
Interdisciplinary	23.1	Public Serv. Tech.	22.2
Social Studies	22.2	Social Sciences	21.3
Engineering	22.0	Health Services	19.5
Fine & Applied Arts	21.5	Letters	18.3
Business & Management	21.0	Mathematics	17.6
Mathematics	19.5	Fine & Applied Arts	17.5
Law	19.4	Business & Management	17.2
Foreign Languages	19.2	Data Processing Tech.	16.4
Home Economics	18.9	Biological Sciences	15.7
Agriculture & Natural Resources	18.4	Education	8.8
Communications	18.1		
Health Professions	17.3		
Psychology	14.3	Total, Four-Year	21.2
Computer & Info. Sciences	11.4	Total, Two-Year	20.3

Source: Department of Personnel and Training Personnel Management Information System, 1992-93

Overall, over 2,100 of Virginia's public-college faculty should retire within the next decade. During this period, the enrollments in Virginia's colleges and universities

are predicted to increase by 65,000 students. The Council's study of how Virginia's system of higher education will accommodate those students, Change and Improvement in Higher Education, acknowledges that fewer faculty can be hired to teach them than the traditional funding formula calls for. If we presume that Virginia will hire only about two-thirds of the new faculty that would be generated for the increased enrollments by the historical funding formulae, by current Council predictions Virginia will need to hire roughly 3,500 faculty members by the year 2000.

Several important qualifications need to be introduced into the analysis of predicted faculty shortages, however. First, the faculty job market, especially at four-year institutions, is a national one. Virginia does not need to produce all of the faculty who will teach at its colleges and universities; only about 15 percent of its professors earned their graduate degrees in the Commonwealth. But the state will need to do its part in producing the next generation of educators, since the nation as a whole will be experiencing much the same imbalance between supply and demand. Beginning in 1997, Bowen and Sosa predict (134) that demand for faculty will begin to exceed supply significantly, even with very few leaving the profession for reasons other than retirement (probably a safe assumption in today's job market). At the national level too the imbalance will vary by discipline. The most severe shortages nationally are predicted in mathematics (50 percent), physical sciences (50 percent), biological sciences (30 percent), and foreign languages (30 percent) (California 12).

Bowen and Sosa make their predictions, however, on the basis of historical hiring patterns and student/faculty ratios, and there are already some indications that those patterns and ratios are beginning to change. One such indication is the uncounted number of doctoral-program graduates who have not been able to find employment in their fields. What society needs is not necessarily what society can or is willing to pay for. So while the National Science Foundation warns of an impending shortage of scientists, the Young Scientists' Network, an electronic bulletin board on which the "hundreds of brilliant young scientists who can't find permanent employment" share war stories, reminds the public and policy-makers of the academic unemployment situation (McDonald A19). Not only does this suggest that institutions are becoming more conservative in their hiring, but some of those graduates would presumably be available for employment when the need for them increases.

Projections of future faculty needs are further complicated by the possibility of other sources for faculty. As other states' fiscal difficulties force the closing of programs or entire institutions, those faculty may well become available for employment in Virginia's institutions. Doctorate-holders in industry and government may be attracted to academia later in their careers. And a reexamination of faculty qualifications might also affect the balance between the supply of and demand for doctorally educated faculty. Prior to the 1970s, many four-year institutions hired professors without the doctorate. During that decade, as doctoral recipients became more plentiful, most could choose among Ph.D.s in hiring new faculty. Increased demand for faculty at the end of

the nineties may encourage institutions once again to reconsider whether a doctoral education is necessary for all faculty members.

This reconsideration would have to take place in a larger context, a change in the reward structures of colleges and universities. Since the 1970s, requirements for tenure have increasingly stressed research, for which doctoral education prepares the newcomers. If institutions come to rely on non-doctorally trained faculty who are not oriented toward research but instead focus their energies on teaching and service, they cannot treat them as second-class citizens. Instead, they will need to regard them as fully fledged faculty members who address an essential element of the institution's mission. The discussion of changes in faculty roles that is now taking place in Virginia as in the rest of the country stresses the importance of rewarding faculty for contributing to the overall mission of the institution in ways suited to their strengths and talents.

In short, to calculate the requirement for newly minted Ph.D.s to fill a need for new faculty at the end of the 1990s is difficult. On the one hand, faculty retirements and increasing student enrollments should drive a demand for new faculty. But that demand may be lessened by the higher student-faculty ratios that are likely to be the result of lessened financial support for higher education, both in the state and nationally. And it may be met to some degree by Ph.D.s not now employed by the academy and by non-doctorally educated faculty.

Since employment prospects vary through time by discipline and even sub-discipline, program quality, and degree type, the balance between unemployed Ph.D.s and the need for new faculty must be determined at the program rather than at the state level. Every graduate program should adjust the admission of new students to the degree that eligible graduates seeking it have found permanent, program-related employment. This consideration should be first among those governing program size, such as the need for a certain number of graduate students to take on teaching or research responsibilities or to meet other program objectives.

Caution about accepting at face value predictions about the faculty shortage should also affect the initiation of new degree programs. William Bowen and Neil Rudenstine, in their study of doctoral education, accept Bowen and Sosa's estimates of the numbers of new faculty needed over the next decade. But they claim that existing programs have the capacity to absorb more students and that smaller, newer programs are generally inferior in quality (68). They therefore conclude that the predicted shortage of Ph.D.s can and should be addressed by existing programs rather than by beginning new ones (Bowen and Rudenstine 10). Given considerations of market demand and Bowen and Rudenstine's analysis, the task force recommends that the Council of Higher Education be conservative in approving new doctoral programs. Only programs of high quality should be approved, and then only when the need for them can be justified, taking into consideration among other factors both potential faculty shortages and the pool of unemployed Ph.D.s in the discipline.

The Need for Professionals

Besides the need to replenish and increase the professoriate, an information-based economy is creating a need for people with advanced education to work outside the universities. Some examples of the demand for graduates of master's and doctoral programs in the post-industrial economy include

- managers of research-and-development teams in industry and major government laboratories.
- creators of public policy. Advanced training is a requirement for many senior positions as legislative staff and in government agencies at all levels.
- persons trained in management information systems. The financial world has become an electronically linked network in which those who can manage the most information win. Business leaders are deluged with information. They need people whose advanced education combines knowledge of business with that of sophisticated and complex electronic databases.
- public school teachers and administrators. In Virginia and elsewhere current and future teachers are being encouraged to acquire disciplinary master's degrees. Today, some specialists (for example, in reading, special education, and English as a second language), as well as educational administrators, must have advanced degrees.
- medical support technicians. Occupations such as those in medical records, hospital administration, and pharmacy increasingly require advanced training or extended undergraduate degrees.
- counselors. From social work to family practice, counselling requires graduate education.
- natural resource managers. Most state and federal resource management agencies require their employees to have graduate training in order that they may deal with complex ecological and political issues.

In order to meet the need for faculty and the demand of business and industry for master's and doctoral graduates, Virginia's colleges and universities will need both to selectively increase the supply of graduate students and to help students who are now in graduate school make it through the system without meeting unnecessary impediments. This report will describe how students make the choice to go to graduate school and identify ways to facilitate their progress through it, so that students may go at a steady pace and arrive at their destination in a timely manner.

TO GO OR NOT TO GO, AND WHERE

The Graduate Population

Enrollments in master's degree programs appear generally healthy and are growing. In Virginia, master's degree production increased by 35 percent over the past decade, with almost all the growth occurring at doctoral institutions. The national doctoral picture is different. While the total number of doctoral degrees in the United States has increased slightly over the past couple of decades, the number of U.S. citizens earning doctoral degrees has declined since the 1970s, with foreign students making up the difference (although that trend began to reverse in 1987). The situation is more positive for U.S. citizens in Virginia, with an overall growth of 77 percent in doctoral degrees in the past decade. But at the same time, foreign student doctoral graduates have increased by over 250 percent and now make up one-quarter of all doctoral recipients. Foreign graduates at the master's level increased by 150 percent during that time. Those students have increased the diversity and sustained the quality of many graduate programs. But since native-born students seem more likely to work in the United States after graduation, it is important that the presence of foreign graduate students not mask the decline in interest of American students in graduate education.

Moreover, the gender and racial balance of graduate students has changed. Native-born white, Hispanic, Asian, and Native-American doctoral degree recipients in Virginia increased by about half, while African-American degrees rose only 20 percent, to a total of 29 in 1992. Among racial groups, nationally the 47 percent drop of African-American male doctoral graduates during the last decade is particularly worrisome (California 15). This situation is echoed in Virginia, which had three fewer black male doctoral recipients in 1992 than the 11 who graduated a decade earlier. Nationally, while male participation has dropped sharply, women have increased their share of doctoral enrollments during the past decade: they are currently 36.8 percent of all Ph.D. recipients, up from 10.8 percent in 1961 (Ries 3). The state does not fully match national patterns of gender distribution: in Virginia, both sexes have increased participation. There are still one and one-half times as many male doctoral recipients in the state as women annually, although this is down from the 2.27 to 1 ratio of the early 1980s.

The Choice

Various factors influence the choice to pursue graduate education. The decision is often made during the undergraduate years. Students are most apt to pursue graduate education in those fields in which they have declared a major or done significant amounts of upper-division work. Unfortunately, the fields in which shortages of doctoral graduates are most expected are those in which undergraduate majors have declined: nationally, between 1970-71 and 1984-85, degrees in the arts and sciences dropped from 40 to 25 percent of all degrees (Bowen and Sosa 47).

In Virginia foreign-language majors, for instance, are scarce, and at some institutions few students take upper-division language courses. The low upper-division enrollments are reflected in the very low production of doctorates in those fields: in 1992, the one Virginia institution with doctoral programs in foreign languages produced only 14 foreign-language Ph.D.s. Yet the burgeoning of lower-division foreign-language coursework (which rose by 79 percent in Virginia's community colleges between 1988 and 1992), the increase in foreign-language requirements on many campuses, the increased attention on global education, and the need of business and industry for workers with a sophisticated knowledge of other cultures all mean that institutions should be encouraging and preparing students to do graduate work in foreign languages and cultures. Institutions with few majors or upper-division enrollments should scrutinize their programs to learn in what ways the curricula or pedagogies are not attractive to students. Students in these programs might be encouraged to major in and then go on to graduate work by good academic advising, which student assessment programs on many campuses indicate is not consistently available.

Over the past several decades, nationally the proportion of the top undergraduates choosing to pursue a graduate education has declined (Bowen and Sosa 112). Such students might become interested in further work in these fields and be better prepared to do it by being given the opportunity to do research as undergraduates. Many Virginia institutions have active programs in research for undergraduates, although they vary in scope; some should be expanded and others developed as model programs for other campuses. It is also important, in developing programs to encourage graduate work, not to overlook students whose primary interest may be in teaching. Undergraduate tutorial or teaching assistant programs might encourage such students to consider college teaching as a vocation.

Advising and research and teaching opportunities should be especially aimed at minority and, in some fields, women students. The loss of academically gifted female and minority students from mathematics and the sciences, for instance, begins in high school, according to a recent study by the Educational Testing Service (Grandy 6-8). Of students scoring above the 90th percentile for their group on the SAT mathematics test, less than 6 percent planned to major in fields like math, statistics, physics, chemistry, or astronomy. For women and blacks, however, the interest is practically non-existent. Since these groups will represent a progressively larger proportion of our student population in the future, it is critical that their interest in these fields be stimulated as undergraduates. In every field women earn a higher percentage of baccalaureate than doctoral degrees. But when they major in a field as undergraduates, with the exception of mathematics, they generally go on to graduate work in numbers roughly relative to those of their male peers (Bowen and Sosa 35-36).

Students who are already pursuing graduate work at the master's level might be recruited into doctoral work . To serve the increasing number of students following a non-traditional path, graduate deans should work with individual programs to develop

agreements between doctoral programs and appropriately designed master's programs. Such agreements cannot guarantee placement or success in the Ph.D. program to all master's graduates, but they could ensure that students who do qualify could transfer without losing academic credit and increasing the time it takes them to complete the doctorate. Such programs might well appeal to students who are the first in their families to go to college and who find enrolling in a doctoral program straight out of an undergraduate one a daunting prospect. They would also give talented students from less prestigious colleges, without the credentials to enter a selective Ph.D. program, an opportunity to show their capacity to do graduate work.

Minority students might well find beginning their graduate work at their undergraduate campus or another small institution an attractive alternative to beginning it at a research university. In Virginia, African Americans comprise about six percent of master's degree seekers. In several areas of study -- particularly English, biological and physical sciences, and mathematics -- Virginia's African-American students are more likely than white and other students to seek the master's degree than to enroll in doctoral studies. Finally, such a strategy would tap a pool of female talent: 54 percent of master's students in Virginia but only 40 percent of doctoral students are women.

Undergraduates are generally isolated from faculty politics and concerns and often perceive the college or university as a place where the brightest and the best "gladly learn and gladly teach," in the process turning their knowledge into research. Those graduate students who might like to pursue an academic career form their impressions about its appeal from a closer observation of it, through one-on-one informal teaching situations that occur as they participate in scholarly projects with faculty and through participation in the academic community as quasi-professionals. Faculty dissatisfaction with their roles and rewards, then, is likely to affect both the quality of graduate students' academic experience and their view of the profession.

One of the most obvious ways this society signals its recognition of the importance of a particular kind of work is through salary levels. Faculty salary increases over the past few years in Virginia have generally not kept pace with inflation, and the Commonwealth's colleges and universities are becoming increasingly less competitive with their peer institutions in hiring and retaining faculty. For this reason, the Council of Higher Education will continue to emphasize to the Governor and General Assembly the importance of keeping Virginia's faculty salary levels competitive.

But pay alone doe not remove all strain in a period of rapid change. There has been considerable discussion in the past couple of years, in Virginia and in the nation, about how faculty roles will have to evolve in order to meet the changing needs of students as the 21st century approaches and to adapt to the straightened budgets that will probably be a feature of higher education for the foreseeable future. For faculty, as for workers in all other professions, changing expectations have led to increased stress. In some cases, these stresses have resulted in conflict within and among departments.

Disputes over the awarding of tenure; competition for space, students and resources; and perceived indifference to their concerns and issues can lead graduate students to conclude that the academy would be an uncollegial place in which to spend their work life.

Graduate deans and department chairs should do all they can to promote a climate of civil discourse among faculty and between faculty and students on campus. Adult students may be uncomfortable with the authoritarian climate of some graduate departments. Their discomfort, if unalleviated, can create dissatisfaction with their graduate work as a whole and affect the climate of the entire graduate school, department by department. That dissatisfaction might be alleviated by appropriate graduate student participation in departmental decisions. Graduate students should also be encouraged to participate in self-governance, for instance through graduate and professional student organizations.

The professoriate itself will need to change to make the academic profession appealing to a new generation. The graduate students who were attracted to academic careers in the 1960s for the most part came from white middle- and working-class families. Their fathers were professional or clerical workers or blue-collar workers in stable, often unionized, industrial sectors. Thus, in the 1960s young men (and they were mostly men) who considered academic careers found much that was familiar and comfortable: modest incomes but a lot of security; short career ladders, but a respected place in the community; 35 years or so of active service followed, on the average, by a decade in retirement. The expansion of higher education gave the young academics of the 1960s unprecedented opportunities for geographical mobility. But in other respects, their work lives resembled those of their fathers.

A return to those conditions is not likely. Most of today's graduate students have come to expect affluence and career mobility. For many of them, job security and community respect are not enough to offset relatively low salaries and limited career mobility. Graduate schools should create incentives for the best doctoral students to enter the professoriate. But they should also make clear that graduates have other options, including return to the campus as senior faculty after they have achieved success in other walks of life. The graduate students of the 1990s will have much longer working lives than their parents and grandparents. Their education must be broad and flexible enough to allow them to move in and out of the academy, particularly in those fields in which business and industry compete for graduates, not only as students but as faculty.

Institutions stand to gain from such movement in and out of the academy. Faculty coming in from fields like business are likely to have a sense of what research would be most relevant to the concerns of the professional community and what students should be taught to prepare them for entry into that community. At the same time, such faculty may not have had the long apprenticeship in the roles and rewards of the academic life that helps prepare those who follow a more traditional path to the

professoriate; their part-time or adjunct status may also isolate them from the faculty community. Rather than letting that isolation develop, institutions should be open to the changes that these professionals suggest need to be made in the academy while, at the same time, helping them adjust to their new role.

Before institutions hire professionals, they should carefully consider both the criteria by which they will assess the professionals' fit with the program's mission; they should then provide the new faculty with appropriate support. Like all new faculty, they may need help with matters from how to construct a syllabus or a test to the various pedagogies and technologies that will be the tools of their new trade. Just as graduate students need mentors to help them understand the complexities of faculty life and responsibilities, so too do new faculty, especially those coming from other walks of life.

Paying for It

Graduate students are adults. Generally they are financially independent of their families and may have families of their own to support. They often come with sizeable debts incurred as undergraduates and may be unwilling to add to that load the costs of a graduate program, which include tuition and fees, living expenses for the school year and summer, insurance, and incidental expenses. All this means that the decision whether to go to graduate school, where to go, and even what to study, is often primarily a financial one. If graduate education poses too substantial a financial burden, many students will forgo it or choose a field in which they can obtain a degree quickly and which will lead to a lucrative career that will allow for the repayment of debt. Degrees in most of the arts and sciences, in which faculty are predicted to be at a premium soon, neither are quickly obtained nor lead to high-paying jobs.

The responsibility for paying for graduate study is borne in varying degrees by the student, the institution, and the state and federal governments, all of whom have a stake in the success of the graduate student. The student, of course, benefits from his or her education and its intellectual and financial rewards. Universities are helped in performing their teaching, research, and public service roles. The state receives both short- and long-term economic and social benefits from the presence of strong graduate programs.

But the exact nature and extent of the state's interest are not as clear for graduate as they are for undergraduate students. Virginia higher education has long had a commitment to provide access to undergraduate education for all students who can benefit from it. The state has supported this commitment, first, by providing some form of undergraduate education within reasonable distance of all Virginians. Second, it has done so by funding some portion of the cost of instruction, although this funding has deteriorated in the past several biennia from 65 to 50 percent of the total. Finally, in order not to deny any student access to undergraduate education because of an inability to pay for it, the Commonwealth has provided individual student access to higher

education through financial aid. Since 1990-91 Virginia has increased its financial aid to undergraduates by 183 percent.

Virginia does try to provide and help fund the costs of master's, and increasingly doctoral, education that is in demand by employers and students within reasonable proximity to those students. But individual students are not considered to have the same right of access to graduate as they do to undergraduate education. Consequently, the need to provide financial aid must be determined on bases other than individual student need.

One is the need for the kind of workers that education will produce. Despite a projected need for educators and advanced practitioners, we do not have reliable data on which to base estimates of just how many the state will need over the next decades and in what fields. Graduate deans should ask each graduate program to make those predictions to the degree possible, and the deans should adjust the financial awards available to each program accordingly. They should also adjust them based on the salaries graduates in each field are likely to earn, and hence their ability to repay loans, as well as whether they have other ways to fund their education.

The competitive nature of the graduate student market is another basis for determining the need for financial support. In Virginia, the types of students enrolled in master's and doctoral programs differ noticeably. Master's students tend to be Virginia residents, often holding full-time jobs and of necessity attending a nearby institution part-time. While the state may want to ensure that students who are bound by work and other responsibilities have financial access to graduate education in those areas in which the state needs educated workers, the competition for those students is often not as intense as it is for doctoral students. At the doctoral level, the best students in most fields are in demand, both for the services they provide and for the prestige they bring. Institutions want to make graduate study on their campuses not only possible for those students but more attractive than at their competitors' institutions.

About 40 percent of the state's doctoral students come from other states or nations, drawn to Virginia both by the reputation and quality of a particular doctoral program and by the total financial package they were offered. In choosing a graduate school, particularly at the doctoral level, a student will look at the entire package of support. An attractive salary as a teaching assistant may be more than offset by high tuition, for instance. Numerous institutional studies of graduate students who are offered admission at one institution but attend elsewhere indicate that most make that decision because of a better financial package at the other institution.

So those financial and graduate-program officers who do not already do so should review periodically their policies on tuition, fellowships, and assistantships, in light of prevailing tax laws, to make sure that their financial awards are competitive. If Virginia's programs fail to be competitive, outstanding in-state as well as out-of-state

residents will attend institutions outside Virginia. In that case, not only their present services will be lost to the Commonwealth but very possibly their future ones as well, since many graduate students stay within the state in which they have studied, especially those not entering the professoriate.

To the degree that funds are limited, institutions should give priority to offering financial support packages adequate to allow students to progress steadily toward and eventually obtain the degree rather than to increasing the size of their graduate programs. In their 1992 study of doctoral education, William Bowen and Neil Rudenstine have shown that the size and shape of the financial package correlates with the time it takes to earn the degree and whether the student completes it. For instance, they suggest that students be provided full fellowship support rather than graduate assistantships during the later stages of their programs, since students who are distracted from conceptualizing and writing the dissertation by other tasks are likely either to take more time to finish it or to drop out altogether (285). Although institutions may need to invest more in each student to follow this recommendation, slow progress toward or non-completion of the degree is to some degree a waste of the state's and student's investment and of the student's spirit and talent. Retention of students already in programs must take precedence over increasing numbers of graduate students.

The usual means of meeting the expenses of graduate school are fellowships, research or teaching assistantships, work-study, loans, savings, outside earnings, or family contributions. A decrease in the various forms of fellowship money might well discourage students who do not choose to add to an existing loan burden and who lack significant private support from going to graduate school. Such a decrease has occurred in federal financial aid: in 1969 the federal government supported 80,000 students through fellowships and traineeships, as opposed to 47,000 in 1989 (Hamilton 11-12). The 1986 tax law, which treats graduate student earnings as taxable income for the first time, has also had a chilling effect.

Beyond this national problem, it is also possible that graduate students are discouraged from attending Virginia institutions in particular. A survey of the University of Virginia's Arts and Sciences graduate students in 1987-88 -- indicating that they were paying 40 percent of their expenses from savings and outside earnings, as opposed to a national average for arts and sciences students of 31 percent -- suggests that this issue bears close examination. Virginia's tuition levels are especially non-competitive. In 1992-93, according to a study by the state of Washington, graduate tuition in Virginia was ranked 12th nationally for residents and seventh for nonresidents (4-5). Students whose tuition is not waived may be discouraged from attending graduate programs at public universities in Virginia by both in- and out-of-state tuition levels.

Given the difference between in- and out-of-state tuition, it is to a student's advantage to be classified as in-state. The Code of Virginia lists criteria by which the establishment of domicile may be determined, such as the state in which students have

lived for at least a year, held a driver's license, registered a motor vehicle, registered to vote, been employed, owned property, had a checking or passbook savings account, or to which they have paid income taxes. Institutions rely on those criteria in determining whether a student has in- or out-of-state domiciliary status. Domiciliary status is not ordinarily conferred when an individual is in the Commonwealth for the primary purpose of attending school, either upon arrival or before completion of the program.

Domicile plays a varied role in the different funding elements that institutions have available to support graduate students. What follows are descriptions of such elements and the effects domicile has on them.

Earned Aid for Graduate Students

Some nonresident, full-time graduate students who are employed as graduate teaching assistants, graduate research assistants, or graduate assistants and who are paid at an annual rate of $4,000 or more are treated as Virginia resident graduate students for purposes of tuition calculation and appropriation. The number of nonresident graduate students counted for these purposes cannot exceed 50 percent of the number of nonresident graduate students enrolled at the institution. General fund appropriations to the institutions reflect treatment of such students as residents. Institutions may waive the difference between in- and out-of-state tuition for the remainder of the nonresident students through unfunded scholarships.

Unfunded Scholarships

An unfunded scholarship is simply a remission of tuition and fees by an institution up to the full required amount. There is no residency or need-based requirement for graduate students under this program. All senior public Virginia colleges and universities may grant such scholarships up to the number of teaching and research assistants with significant academic responsibilities who are paid at least $2,000 a year. They should also be permitted to waive the differential between the in- and out-of-state tuition for those students who bring with them national fellowships.

Unfunded scholarships are not included in an institution's appropriation and are not directly supported by the general fund. To support them, an institution may pass the costs on to paying students or not collect the remitted tuition and fees, thereby reducing its available resources. In 1991-92, institutions awarded $12.8 million in unfunded scholarships to 4,100 graduate students.

Discretionary Financial Aid

All public institutions receive general fund appropriations to support discretionary student financial aid. Such funds may be used for both graduate and undergraduate students. Institutions may use up to 50 percent of this appropriation for graduate

students. No more than 50 percent of the amount used for graduate students may be awarded to students who are not Virginia residents. Institutions may set the amounts of awards, which may or not be based on need, and require a graduate recipient to perform some specified service, e.g. serving as a graduate assistant.

In 1993-94, institutions plan to use $7.7 million of their general-fund discretionary-aid appropriation for graduate students. They have awarded less than one-fifth of that amount based on financial need. Unlike the appropriation for undergraduates, the appropriation for graduate discretionary financial aid has not been based on a student's demonstrated need for it. In recent years, additional funds for graduate aid have simply been tied to the percentage increase in the undergraduate amount.

How much discretionary aid institutions need is a question that needs further discussion. The Council of Higher Education has just begun to collect student-specific data on graduate students. It has records of financial need for undergraduates and can calculate total state financial need, but it cannot currently do this for graduate students. It has therefore asked institutions that request additional discretionary aid for graduate students to justify those requests in their budget addenda. This information, and a review of other factors that drive graduate aid, will be useful in determining the need for additional graduate discretionary financial-aid appropriations.

Virginia Graduate and Undergraduate Assistance Program

Established by the 1990 General Assembly, this program functions much like the Eminent Scholars Program. It provides for the use of general funds to match a public institution's income earned on endowment funds created specifically to support financial assistance to graduate and undergraduate students. Awards may go to exemplary resident and nonresident full-time students for payment of tuition, fees, room, board, or other educational expenses. Endowment funds for this program must be created after June 30, 1991; the first awards were made after July 1, 1992.

Domicile obviously plays a role in how graduate students are supported at Virginia's public institutions. The general fund does support the differential between in-state and out-of-state tuition for a limited number of nonresident assistants. Equal amounts of general-fund supported discretionary aid may be awarded to residents and nonresidents. Unfunded scholarships supported totally by institutional funds may be awarded without regard to domicile, as may awards made under the Virginia Graduate and Undergraduate Assistance Program. The Council staff conducted a survey to determine how Virginia's use of domicile in providing financial support to graduate students compares to what is being done in other states. From the responses, Virginia seems fairly typical in the role that domicile plays in the general-fund and institutional-fund support of graduate students.

Recommendations

Each of the various means of funding graduate education mentioned above has merit and should be part of a total graduate-aid strategy for the Commonwealth and the institutions.

The most substantial form of graduate-student support is earned aid -- that is, paying students to work. In 1992-93, Virginia's public colleges spent about $20 million in salaries and benefits for graduate students. The Commonwealth has an interest in seeing that graduate students intending to teach participate in instructional activities, for which they are formally prepared and at which they are carefully supervised. These students, after all, will become the faculty of tomorrow and need to prepare for their future profession through such an apprenticeship. At the same time, graduate students should not be so overwhelmed by teaching responsibilities that they do a poor job of it or their progress towards the degree is slowed or stopped. Bowen and Rudenstine suggest a limit of two years of part-time teaching for doctoral students for this reason (286). And provosts and college deans have a responsibility to monitor the proportion of each undergraduate program taught by teaching assistants to make sure that undergraduates have sufficient access to full-time teaching faculty. The presence of teaching assistants in a department should not relieve faculty of their primary responsibility for undergraduate education. It is a sign of imbalance, for instance, when the University of California at Berkeley could not meet 70 percent of its lower-level classes when its graduate teaching assistants went on strike.

Students supported by research grants have a better record of completing their degrees in a timely fashion, but such students sometimes find that their own research objectives do not coincide with their assignments as research assistants. In the latter case, universities should consider providing funding to help these students defer research costs. For example, Virginia Tech's Graduate Student Assembly's graduate research development program provides up to $500 per student through competitive review for unique research undertaken by Tech's graduate students.

The Commonwealth, meanwhile, should fund salary increases for graduate assistants that are comparable in percentage to those for full-time faculty. In recent years when the Commonwealth provided differential salary increases for faculty, the percentage increase for graduate assistants tended to be smaller. But graduate assistants resemble faculty more than any other category of state employee, and it makes sense to base salary-increase percentages for graduate assistants on the same system of peer institutions used for full-time faculty. For the same reason, colleges and universities should consider, to the extent that it is financially feasible, extending other worker benefits to graduate assistants. The market for graduate students, like the market for full-time faculty, is a competitive one.

In addition, the Commonwealth and the institutions should explore other options

to make sure graduate education is financially accessible and nationally competitive. First, if institutions believe additional state funds for graduate financial aid are important, they should express themselves through the budget process. In recent biennia, funding for graduate financial aid has not emerged as a high institutional priority. Second, institutions that feel they can charge higher tuition should give some of that money back to students in the form of financial aid. Currently the University of Virginia is the biggest user of this form of graduate financial aid. In 1993-94, the University of Virginia will award $2.6 million from tuition revenue to graduate students.

A third avenue for additional financial aid is the Virginia Graduate and Undergraduate Assistance Program, described earlier. Approximately $30,000 was specifically targeted for graduate students in 1992-93. In 1993-94, the General Assembly appropriated $125,000 for this program. This will meet about 51 percent of the institutions' requests; they expect to generate almost twice that amount in eligible endowment earnings, thereby making a total of close to $375,000 available for financial aid. This program is expected to grow quickly in the next several years. Institutions should be encouraged in their laudable efforts to raise private funds for this program; the General Assembly could promote its growth by increasing funds to match eligible endowment earnings.

GETTING THROUGH

Once a student has put together a financial package and decides to enter a graduate program at a Virginia institution, what factors are likely to facilitate his or her progress through it?

Program Structure

Given the diversity of student needs, disciplines, and institutions in Virginia, the ways in which graduate programs encourage the development of their students vary widely, as they should. But effective programs have some elements in common. They ensure that students are well prepared for their future employment. For students whose career plans are non-academic, they provide experience with the kinds of work they will do, and perhaps internships in the kinds of agencies or businesses that are likely to employ them, after graduation. Some institutions even provide practica within the institutional administration for graduate students in appropriate programs. Beside offering students valuable experience in a real work setting, such internships give faculty an opportunity to continually reevaluate the needs of the workplace and determine whether they are preparing students for what they will actually do. Faculty can then modify program curricula to address any disparities between the skills needed by the workplace and those they are developing in their students.

Since one goal of graduate education is to educate future teachers or professors, and since the excitement of teaching is often a bright spot in a graduate education, good programs often require a teaching experience for those planning to enter this field, with attendant field-specific teacher training. In supervising teaching assistants, faculty provide help with issues such as giving good lectures, encouraging active learning, planning a comprehensive syllabus, assessing student learning, advising students, and dealing with student problems.

Faculty further help graduate students planning to enter the academic life understand what it means to be a member of the profession by demonstrating for them its ethics, encouraging the independent thinking that characterizes the best teaching and research, and acquainting them with their public-service responsibilities. They may also help their students find dissertation fellowships and, later, jobs; involve them in various collaborative activities like conferences and publications; and generally help them make the transition to independent teachers, researchers, or professionals. Because of the importance of this mentoring relationship, many faculty choose to rely on graduate assistants rather than postdoctoral students when they undertake research projects, even when that choice is less cost-effective. To encourage excellence on the part of graduate students in regard to teaching, research, and service, departments and graduate deans should establish award programs that recognize superior performance.

But traditional methods of ensuring students' acculturation into the discipline have

become less reliable in recent years. Faculty less and less resemble the students they teach. In order to mentor their graduate students effectively, faculty have to go well beyond official policies prohibiting discrimination based on race, gender, or sexual orientation and try to understand the differences between them and their students. Perhaps even more difficult, today's graduate students are increasingly likely to be part-time students with full-time responsibilities elsewhere, whether they be professional, domestic or both. To accommodate them too, graduate programs have to change substantially, as many are beginning to do.

Language is a powerful tool, and nowhere more so than in the academy. A serious attempt to change departmental culture might well start with changing the professional jargon: full-time graduate students are still called "traditional," which seems to be a code word for legitimate or preferred. The typical graduate student is no longer the white male in his early twenties who is pursuing graduate work full-time. In 1992, only eight percent of Virginia's graduate students fit this description.

Successful graduate school work has, in the past, required full-time commitment and acceptance of schedules tailored to the preferences of influential faculty. Departments can acknowledge the permanent reality of part-time adult students by adjusting schedules for classes, advising, and support services to their needs, as they have on a number of Virginia's campuses. They can also adjust for the fact that such students typically cannot perform traditional graduate student chores.

The curriculum and graduate student research may be affected by the expectations of these new students. Employed graduate students have experiences of a workplace increasingly characterized by high-tech communications, an emphasis on production, an attention to the economic ramifications of decisions, and work in teams that are often cross-disciplinary. To such men and women -- usually older, always more independent, sometimes more demanding -- distinctions such as the departmental ones separating disciplines may represent an antiquated way of addressing the problems that the academy exists to consider. Multidisciplinary wrestling with real problems in class or in the laboratory or field is likely to suit such students and provide an additional bonus: the bringing together of faculty members from different areas whose relationship may be tenuous.

The delivery of instruction has already been and will continue to be affected by the needs of the new graduate students. Virginia's graduate engineering program taught via television, addressed to professionals who continue to work, has already shown the potential of interactive televised instruction. The challenge is to find alternatives to the traditional residency requirements that integrate students into the learning community and teach them the values and vocabularies of their disciplines, alternatives that will serve as well and fit better into students' lives. Some, such as short-term weekend or summer courses, simply involve creative scheduling.

More radically, information technology is enabling the creation of new kinds of learning communities, such as work groups that meet electronically rather than physically. Interactive technologies such as electronic bulletin boards can bring together students and professors who are at different locations in a remarkably satisfying partial replacement for face-to-face contact. Moreover, those technologies can integrate all of the learning resources available to the student -- on the campus, at home, and in the workplace. In the early years of the 21st century, these technologies, some of which are now at the experimental stage and expensive, are likely to have the same impact on universities that telecommunications had in the 1970s and personal computers in the 1980s. Especially at the graduate level, they will permit programs to combine flexible opportunities for individual learning with appropriate residency within the academic community. These communities could be larger (there is less need to remain within the confines of one campus) and much more diverse than traditional graduate programs, because they could include full and part-time students and other resource people with appropriate knowledge and skills. Potentially, these new learning communities could provide much greater resources than even the richest universities can aspire to. And they would make it much easier for students to combine graduate work with employment and family responsibilities.

Eventually, large graduate programs delivered in this way could also be less expensive than traditional forms of instruction. But the initial investment necessary to develop and use the new technologies, both in resources and faculty time, may be considerable. That is an investment to which the task force suggests that state give high priority as it funds projects related to the recommendation of the Commission on the University of the 21st Century.

Clearly graduate programs must develop new vehicles for conveying the values, the models of professionalism, and the development of a philosophy about a discipline if they are to ensure that attainment of a graduate degree is to be possible for the new student. At the same time, those responsible for the programs should keep careful track of those experiences, in terms both of learning and of student satisfaction, to be sure that quality is not sacrificed to convenience.

Support Services

Graduate students are a distinct type of university citizen and need to feel themselves to be a valued part of the community. They are students, and yet those who are a part of the teaching or research staff also play a very important role in the smooth and efficient functioning of the university. The institution should consider granting them certain privileges that mark their position between undergraduate students and faculty. Provosts and graduate deans should examine all their programs, from fees to privileges to benefits, with the intent of establishing policies that are appropriate to their distinctive status.

For instance graduate students, like undergraduates, require support services to ensure that their lives run smoothly and that conditions for study are optimal. But those who are acting as employees of the institution should also be given services that will enable them to carry out their responsibilities. While acknowledging that institutions may not be able to afford to address all of them, the graduate students advising the Council on this report have identified some student needs that institutions might consider in designing graduate student-support packages.

Health Insurance

The national problems associated with health insurance are found in microcosm in the graduate schools of Virginia. Graduate students are generally adults, which means that often they have given up full-time employment to come to graduate school and may have spouses, partners, or other dependents. Besides foregone income, then, the decision to pursue graduate study may entail higher expenses with respect to health insurance, a cost that increases if an employed spouse has also given up his or her job to move to a new location.

Institutions are encouraged to offer, to the degree possible, comprehensive health insurance packages for single and married graduate students, both with and without children. For graduate students who, as teaching or research assistants, are part of the institutional staff, the percentage of the premium paid by the student should be in line with those offered to faculty and staff. Such insurance may be very costly or difficult to provide, however, since state personnel regulations dictate that part-time employees cannot participate in the state health insurance plan. This is an argument for a relaxation of state personnel regulations that make it difficult for institutions to manage their business as effectively as possible. Finally, the graduate dean or program head should negotiate with the student the schedule by which the premium is deducted, whether it be monthly, quarterly, half-yearly, or annually.

Privileges

Some privileges that the graduate student members of the task force have identified as particularly desirable are longer due dates on books checked out from the library; specially designated graduate study areas in each building and the library; easy (or for teaching or research assistants, free) access to copiers, binding machines, FAX machines, telephones and word processors; career planning and placement services designed for graduate students; and easy (or for teaching or research assistants, free) access to computing facilities designated for graduate student use only, with access to free laser printing. Finally, parking on every campus generates as much anger as death or taxes, for graduate students as for others. Again, those graduate students who are part of the research or teaching staffs of the university should have parking privileges not akin to those of undergraduates but to those of other university employees, so that they can perform their duties efficiently.

Housing

Virginia's colleges and universities generally design student housing with traditional undergraduates in mind. The needs of graduate students -- from quiet for long hours of study to provisions for families, including kitchen and laundry facilities, day care, and playgrounds -- are often not taken into consideration. While costly to provide, separate housing with these facilities may be a necessity to attract and retain graduate students at some institutions.

The Academic Program

The nub of a graduate student's experience is, of course, the academic program. For that program, faculty and students share responsibility. Each student is ultimately responsible for the conduct of his or her own graduate education, provided that faculty members remove from their path all unnecessary obstacles. Faculty are responsible for designing, delivering, and evaluating the program. In so doing, they should develop clear goals for what students should know and be able to do when they complete the program, as well as clear expectations for progress toward those goals. And they should communicate those goals and expectations to students, as well as information about what students can expect as members of this academic community.

Departments should engage in regular, structured self-scrutiny in order to give students an experience that will make the years of work and hardship intrinsically rewarding. A number of graduate departments in Virginia regularly undergo program review, either by institutional policy or for purposes of programmatic accreditation; those that do not are encouraged to do so. The program review typically begins with a self-study. This should be written by the department, including students, and, according to the Council of Graduate Schools, describe the mission and organization of the department in a way that addresses the following questions:

- What do you do?
- Why do you do it?
- How well do you do it, and who thinks so?
- What difference does it make whether you do it or not?
- How well does what you do relate to why you say you do it? (17)

The self-study should then describe the program's resources: faculty qualifications and numbers; facilities; computer, library, and other support; the characteristics of the students in the program; and the department's support for them. It should describe the curriculum and requirements. It should include information about enrollments and retention and graduation rates. Programs should provide statistics on the number of graduates from previous years who are still seeking program-related employment. The self-study should disaggregate these data to make clear which groups of students are

having which experiences. The categories should include at least gender, race or ethnicity, part-time versus full-time status, age, and financial-aid category.

Finally, the self-study should describe direct indicators of student learning and satisfaction. Graduate programs usually require at least one cumulative piece of work -- the thesis, dissertation, or culminating project -- and often have others, such as oral or comprehensive examinations. Departments should look at these not only as discrete indicators of the success or failure of particular students but in the aggregate, as indications of where the program is succeeding in teaching students on the whole and where it is not. Student satisfaction may be gauged by surveys or by focus group interviews.

An external review often follows the self-study, done either by faculty drawn from within the university or, better, by faculty brought in from the outside. They can act as consultants, helping the department see what its strong points are and where it might improve. The dean and chief academic officer should play major leadership roles in this process, giving the department appropriate support and making sure it follows up on findings. The process should provide administrators information about how and when to sustain, develop, curtail, or discontinue programs. It should also give them data with which to help responsible agencies outside the university make informed decisions about resource allocations.

Time to the Degree

One critical aspect of the discouragement all students may well feel during their graduate work is the increasingly long time it takes to complete the degree, if they complete it at all. Master's as well as doctoral programs should be concerned about and scrutinize the time-to-degree and completion rates of their students, but recent general studies of the time it takes students to finish the graduate degree have focused on doctoral education. After having decreased through the 1960s, the median total time required to complete the doctorate across all fields increased by two and a half years between 1971 and 1991. In 1991 it took an engineering student, on average, just over six years as a registered student beyond the baccalaureate to complete the doctorate and a humanities student almost eight and a half (Ries 15).

One question that these studies address is whether the increasing total time it takes students to finish the degree (called "total time-to-degree") is explained by longer periods during which students stop out of graduate study or by more time spent in pursuing the degree while registered (called "registered time-to-degree"). Since increases in the registered time-to-degree account for most of the increases observed in the total, graduate students are evidently taking lighter course loads or spending more time in dissertation-related activities.

The increase in both registered and total time-to-degree has widely been

presumed to have dampened graduate enrollments, although the upward trend in total graduate degrees conferred since 1987 contravenes that assumption and may suggest that the problem of attracting students to graduate school is decreasing. But there are other reasons to be concerned about the increase in the time taken to complete the degree. One is the cost of graduate education. Another is that the market cannot respond quickly to demand, and institutions must pay a high price for those trained in shortage fields. This problem is exacerbated when students do not finish their doctoral programs at all; the cumulative completion rate for the most recently studied cohort at eight universities was about 57 percent (Bowen and Rudenstine 119). As Bowen and Rudenstine point out, a number of students drop out of their programs late in the process: eight out of ten students who begin their second year of doctoral education make it to the all-but-dissertation (ABD) stage, but then only eight out of ten ABA students complete the degree (112). While some students will drop out at each stage of graduate studies for reasons beyond the institution's control, programs should do everything in their power to facilitate students' completion of the degree.

Completion rates are generally inversely related to the time-to-degree, and students in the sciences have always done better on both measures than those in the humanities (Bowen and Rudenstine 11). According to a late 1980s University of California at Berkeley study, for instance, students in the physical sciences at the university had a mean time to the doctorate of six years and a completion rate of 67 percent, whereas language and literature students took a mean time of almost nine years, with a completion rate of 30 percent (Duggan 1-2 ; Bowen and Rudenstine give 7.8 years as the national median total time-to-degree in the physical sciences). One hypothesis is that science students have the advantage, in their research assistantships, of working closely with mentors on topics related to their dissertations. Workshops for students in the humanities and social sciences on dissertation-writing and requirements that they meet with advisors might alleviate the isolation that slows down some of these students. Another hypothesis is that the sciences generally have more structured curricula and "more agreement concerning appropriate methodologies . . . and therefore less risk that a graduate students will become so perplexed that the Ph.D. is never obtained" (Bowen and Rudenstine 127). Bowen and Rudenstine recommend that programs in the humanities and social sciences have more structure, including "clearly specified objectives, incentives, and timelines" for the completion of program requirements, and curricula shaped to meet the needs of students rather than the research interests of faculty (14 & 281).

A number of explanations have been given for the increasingly long time it takes students today to complete their doctoral degrees. One is the knowledge explosion and the increasingly interdisciplinary nature of research, the latter entailing the need to master more than one set of disciplinary skills. The slow job market -- which is presumed to have motivated students to stay in safe, if not very remunerative, positions within academe -- is sometimes blamed. The decrease in federal financial aid, which forces students to take part-time jobs and slows their academic progress, is

often identified as a major culprit. Heavy reliance on teaching assistantships in the humanities and social sciences is found to significantly lengthen the time to the degree (Bowen and Rudenstine 191). Students who finance their own education take even longer, which may partially explain the slower pace of students enrolled in social sciences, education, and professional fields, who must rely heavily upon personal resources rather than university support. The entry into the graduate student body of more older, part-time, working, and women students -- all of whom are supposed to have competing priorities and who may find the environment less welcoming than younger white male graduate students -- is sometimes given as a reason. Although all groups show an upward drift in the time taken, age is the single most influential factor lengthening the time spent. But gender and ethnicity are also correlated to pace: women are registered for about half a year longer than men and African Americans a year longer than Asian Americans before finishing their studies (Ries 16). This difference may be attributable to field, since Asian Americans and men are more likely to be enrolled in programs with shorter average times-to-degree.

The dissertation is clearly a stumbling block for students in some disciplines. Bowen and Rudenstine have found that the period during which they are selecting their topic, not just when they are writing the dissertation, is difficult for many students: they may have had little training in conducting independent or interdisciplinary research, are now expected to generate opinions after extensive training in skepticism, and may have unrealistically high expectations about the quality of work they must produce (13 & 254-256). A report to the Council of Graduate Schools on the role and nature of the dissertation concludes that while traditional disciplines share some basic expectations, "there is no generic concept of the dissertation" (1). Even very basic questions would be answered differently from department to department: how to define "original" research; whether collaborative projects, pre-dissertation or previously published research are acceptable; what is the form of the dissertation; what are the requirements for residency while it is being written; whether a prospectus is required; and how funding patterns affect access to data or choice of topic. Every department should examine its policies on these issues to be sure that they are not too rigid or unrealistic and that they are clear to students. How long the dissertation takes on average and the kind of guidance faculty members give students in writing it also vary greatly. Those departments whose students take an inordinately long time to complete the dissertation should be sure that their requirements are reasonably related to program goals and that they monitor, support, and reward advising.

Each graduate program needs to keep track of at least two measures: the average length of time it takes students to complete the degree and the percentage who eventually complete it. Since the increase in registered time in doctoral programs is due to a combination of variables that differ by field, each department should also study the factors that delay their students in completing doctoral work or stop them altogether. It is also critical that programs monitor the time it takes for part-time students to get the degree and the percentages of them who do so. Every program

should publish standards for the rate at which they expect both full- and part-time students to progress and should make it possible for them to do so. Bowen and Rudenstine suggest that the norm for full-time doctoral study not exceed six years (282).

Communication With Prospective and In-Coming Students

Because of incomplete early communication, some graduate students in Virginia report feeling that they did not have the information they needed to make informed decisions about graduate studies. The formal acceptance letter should include the specific commitment the institution is willing to make to that student, and the limitations on amount and time of that commitment, with respect to financial aid. It should also detail the reciprocal responsibilities of the student. In addition, to avoid later student dissatisfaction and surprise, each graduate program should develop and send to all prospective and incoming students a brochure addressing at least the following questions:

- What resources are available to graduate students, including library and laboratory resources, equipment, and technological support like access to electronic mail and bulletin boards or mainframe or other computing?
- What services are available to students -- for example, registrar, cashier, student records, housing, food services, parking, legal counseling, health services -- and at what hours?
- What are the coursework and other requirements for the degree?
- What are the residency and other enrollment requirements for the degree?
- Apart from coursework, how much time are students expected to spend preparing for comprehensive and qualifying exams and preparing and defending their theses or dissertations?
- What is the function of the comprehensive or qualifying exam? Is it a screen or an integrative experience?
- Is the thesis or dissertation supposed to be an original piece of research and if so, to what degree and of what scope?
- Can a student use a project initiated at the workplace as a thesis or dissertation topic?
- How much help can students expect from faculty in choosing a thesis or dissertation topic?
- How much interaction can students expect from faculty as they write their

dissertations?

- What formal and informal mechanisms are available to the student who feels impeded in making reasonable progress toward finishing the thesis or dissertation?

- What are the general nature of and time limitations on the commitment to financial support for graduate students?

The brochure should also contain the following data:

- The average time to the degree for full and part-time graduate students in the program, both registered and total;

- The average amount of time students have spent preparing for exams historically;

- The average amount of time spent writing the dissertation by students historically, once coursework and qualifying exams are complete;

- The percentage of students beginning the program who complete it; (Bowen and Rudenstine quote the AAU and the AGS as saying that not to do so is "false advertising"-- 287) and

- The percentage of students who have found program-related employment after graduation and of what kind.

CONCLUSION

If the nation in general and Virginia in particular are to meet the need for faculty, as well as the need for educated workers of all kinds, that will become so compelling as the new century unfolds, graduate education is the key. The state should see if there are ways to better support graduate study, and institutions should make the environment welcoming to the kind of students they will need to encourage in the future, their programs as good and flexible as possible, and the time it takes a graduate student to complete the degree as short as is consistent with responsible preparation for a lifetime of productive work. As in the provision of high-quality undergraduate education, Virginia's colleges and universities make an important contribution to the well-being of the Commonwealth through effective graduate education.

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