



## QUALITY AND GRADUATE EDUCATION: PATHS TO EXCELLENCE

*William G. Tierney,*

University Professor and Wilbur Kieffer Professor of Higher Education,  
Director, Center for Higher Education Policy Analysis,  
University of Southern California, Los Angeles, CA 90089



**William G. Tierney** is Director of the Center for Higher Education Policy Analysis and Wilbur-Kieffer Professor of Higher Education at the Rossier School of Education. He is the past president of the Academic Senate of the University of Southern California. He also served as president of the Association for the Study of Higher Education. His research interests pertain to organizational performance, equity, and faculty roles and rewards. Dr. Tierney teaches courses on the administration and governance of higher education and on qualitative methods.

His recent publications include *Preparing for College: Nine Elements of Effective Outreach* (edited with Julia Colyar and Zoë Blumberg Corwin; SUNY Press, 2005), *Competing Conceptions of Academic Governance: Negotiating the Perfect Storm* (editor; Johns Hopkins University Press, 2004), and *Building the Responsive Campus: Creating High Performance Colleges and Universities* (Sage Publications, 1999).

He is currently involved in a variety of funded projects that pertain to two broad areas: equity and access, and governance and decision-making. Dr. Tierney conducts research pertaining to the effectiveness of programs that prepare low-income youth for college; he is also involved in projects geared toward improving governance and decision-making in colleges and universities.



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Graduate education presents a quandary to those who work in universities as well as those who are state and policy analysts. On the one hand, graduate education is more expensive to operate than undergraduate education, and in some disciplines, such as chemistry and physics, it is significantly more expensive. Although it is possible that someone with a bachelor's or master's degree could teach an undergraduate course, only individuals with a doctorate are likely to teach and advise doctoral students. Professors who hold a doctorate are more expensive than faculty with only a master's or bachelor's degree. A graduate program with high standards that is entirely composed of part-time, or adjunct, faculty is untenable, whereas that is not the case with selected undergraduate degrees.

On the other hand, one indicator of quality is that an institution has graduate programs. A country that must send its students abroad for graduate education will have fewer trained scholars than a country where the universities provide doctoral degrees. The professional needs of a country can best be met by local institutions. The improvement of universities also will take place at a quicker pace if more PhDs are produced, and that will happen if the country has graduate programs of quality. If only a few graduate programs exist, then the country must rely on training from foreign countries. Globalization suggests that economically vibrant countries will need an increasingly well-educated citizenry, which generates the inference that graduate education is imperative.

However, if an institution is to begin or sustain viable graduate programs there needs to be clear indicators of quality. In this paper I consider (a) what sorts of questions might be asked to gauge the quality of graduate education, (b) what information is needed to answer those questions, (c) what measures might be employed in developing a response, and (d) which constituencies should be involved in the analysis and evaluation. In what follows, I first consider the differential roles of various constituencies, and I then turn to what I shall call vectors of analysis. I then consider the challenges in creating quality programs and conclude with a suggestion for best practices.

### Differential Roles for Graduate Education

Perhaps more than undergraduate education, graduate education calls upon inter-relationships amongst four constituencies. Whereas one or another group, such as faculty, might have a greater say in undergraduate education, the challenge for graduate education is that coordination and cooperation are necessary even though different groups may have conflicting interpretations of the import, substance, and focus of graduate training.

### *Faculty and Administrators*

The faculty are responsible for the curricula and teaching of graduate education. In general, faculty who hold the doctoral degree prefer to teach graduate education. Classes are generally smaller and more focused on one's research interests than are large survey classes for undergraduate education. Graduate education also has students who engage in research that supports what the faculty do.

However, the nature of knowledge continues to change and the result is that faculty have to be better prepared and more knowledgeable about immediate currents in a particular discipline than in undergraduate education. Such an observation is particularly true in the 21<sup>st</sup> century where the cordoning off of a discipline no longer suffices and research is increasingly interdisciplinary. Faculty also need to make clear what sorts of support are necessary to ensure that they have the infrastructure to develop quality programs.

Management structures also need to exist that support research. Such an observation is entirely different from calling for effective administrative structures that enable quality teaching and learning. A research infrastructure suggests that the university is prepared to seek funds from a diverse array of sources in a manner that is usually not done in institutions with only undergraduate degrees. Budget structures that foster interdisciplinarity are also quite different from those that exist as line items for an individual or department. Because universities usually will not offer every graduate program but instead a subset of the programs they offer for undergraduate education, the likelihood also exists that individuals will come to the institution from a geographic area greater than those who come for an undergraduate education. If the program has substantial quality then students from abroad also will take graduate classes. The result is that graduate education requires processes that enable students to attend that may require substantial resources and procedures.

Finally, faculty and administrators need to develop effective measures for analyzing the quality of a particular program. How often will the program be evaluated? Who will evaluate the program? What are the consequences of programs that have low quality? I will return to these questions in a subsequent section, but the questions are central to the roles of faculty and administrators.

### *Policymakers and the State*

Public institutions are responsive to the needs of the state and the priorities outlined by policymakers and ministries. Other than in the United States, the vast majority of research and graduate education is conducted in public institutions. The result is that faculty and administrators are unable simply to determine that they want to offer one or another program without the substantial support of public entities, such as the Ministry of Higher Education.

If graduate education is a national priority then the state budget for research, buildings, and financial aid will reflect it. Such a strategy holds rewards, but there are obvious risks. Research does not have outcomes that are certain; research is always a risk. Some research projects will succeed and others will fail. Similarly, graduate students are not certain to excel at research. Such points are particularly true with regard to new areas. Nevertheless, it is precisely these new areas of research where the state needs to reward creativity and risk-taking. States,

however, are generally cautious. The result is that to support graduate education runs counter to the basic instinct of bureaucratic entities.

States also have a significant say in the types of students who attend universities. Such an observation suggests that a state's ability to direct resources toward under-represented groups such as women in the sciences or ethnic minorities is significant. Similarly, the state determines how easy or difficult it is for foreigners to come to the country for graduate study. Those who receive graduate degrees from a host institution hold significant potential for the country. Yet that potential is lost if there is no clear pathway to permanent residency for those students who are among the best in their fields.

Insofar as many fields will have a close interaction with business and industry, the state needs to develop policies that enable fruitful exchanges to take place. Again, even though a business or a university may support such interactions does not necessarily make systemic relationships possible. The state has the ability and responsibility to forge such relationships.

### *Business and Industry*

Those who work in business and industry have perhaps the clearest understanding of the benefits of a well-educated workforce and the employment needs that are on the horizon. Accordingly, the active and vocal support of leaders of business and industry in delineating the needs of graduate education is essential. In some countries, such as the United States, that call upon a diversified funding model, these same leaders also provide fiscal support for building, infrastructure, and graduate student support.

Those institutions that are the best in science, technology, engineering, and mathematics are nevertheless not particularly savvy with regard to technology transfer. A closer relationship between business and industry that protects the intellectual property of the developer of a particular innovation but enables that idea to be taken to market has the potential to benefit society. Business and industry also has the ability to develop internships, fellowships and employment streams that enhance the idea of graduate education. Those groups that are best positioned to support risk-taking that prepares individuals for work in a global economy are those captains of business and industry that are involved in competing in knowledge-based businesses and companies.

### *Vectors of Analysis*

If one were to investigate the quality of graduate education there are many indirect effects that might be investigated, such as funding. However, the three most important components are what I consider here, for without analyses of these vectors, one can make no claim to having a quality graduate program.

### *Faculty Productivity*

Those who account most for the quality of a graduate program are the faculty. They teach the students, conduct the research, and oversee the curricula. How might one judge the quality of the faculty? There are, of course, reputational measures such as the prizes one has won and the honors that have been awarded. Generally, faculty reputation depends upon one's research output, external funding that has been generated, and the quality of the journals where

one's research appears. The numbers of times that someone's work has been cited by others and the impact that the work has had on the field are also of import.

The cumulative numbers of these characteristics are what account for one part of program quality. A department that has one well-regarded, well-cited, senior professor may not account for much as opposed to a department that has several senior faculty who may not be as well-cited as the lone individual, but the department's overall ratio is higher. In developing programs we frequently see that faculty hold doctorates but they do not do research and their degrees are from second tier institutions. The more faculty who have their terminal degree from a top-ranked program is yet another clue about program quality. Indeed, the number of full-time faculty in a program and the percentage of graduate faculty who teach and supervise dissertations are the sorts of issues that need to be investigated. Although external funding is not important in some disciplines, in many fields that is one key indicator of prestige. Further, in general, the more notoriety an individual and department have on the international stage is one key clue that the program approaches quality.

### *Student Productivity*

The nature of student quality is akin to that of faculty productivity. Where students studied prior to graduate school and what kind of work experiences they have had matters. Clearly, a student who attended a second or third tier university and worked as a cashier at a grocery store is less impressive than a student who attended the best university in the country and received a prestigious fellowship upon graduation. If students garner prizes for their work or dissertation also will be taken into account as an indicator of student quality. Students increasingly need to have published work in some fashion, and increasingly, in a refereed journal. They need to have evidence of presenting their work at conferences and to have some ability to teach and do research on their own without the support of their mentor.

The most important point pertains to job placement. A graduate program aimed at improving its quality will see a steady stream of students being placed in first-tier universities in research positions, and/or in research positions in the best corporations and industries. How can a program make claims to quality if those who they train do not take up prestigious positions? The point, after all, of graduate education, is to educate graduate students. A quality education suggests that students learn more than simply the material that is presented to them. A successful graduate student is someone who is able to demonstrate that learning by the sort of position he or she assumes upon completion of the doctorate. A longer term question has to deal with what graduates of a particular program are doing five to seven years after their completion of the doctoral degree. One would assume that successful graduates of successful programs have begun to establish a reputation for their program by the indices suggested of faculty that I discussed above.

### *Nature of Training*

A relatively new way of thinking about program quality is to look not only at summative measures – how many graduates go on to prestigious positions, how many faculty are members of important international organizations, and the like – but also to investigate formative measures. In particular, one will look at the type of interactions students have with one another and their professors. Students are less likely to succeed if they are disengaged with other students and/ or receive poor or little advice from the faculty. The type of structural support that

a program is able to provide also matters. Students who have research assistantships do better than students who have little support or must work as teaching assistants. Students who are able to conduct research in laboratories, have a quality library to use, and access to state-of-the-art internet capabilities will be judged at a better program than those who do not. And finally, students who are able to learn in new, interactive, cooperative learning programs rather than programs that utilize teaching and learning pedagogies from a generation ago also are more likely to succeed in a program that is considered of high quality.

### Challenges to Creating and Sustaining Quality

I have touched on three overarching categories for the analysis of quality. Obviously, formative and summative measures of quality have several discrete indicators that enable individuals to develop a quality program or impede such progress. If one were to investigate the quality of a program, what are the challenges that might exist in order to achieve quality? In particular, eight challenges exist that I now consider.

#### *Funding of Program*

A program that has only a modicum of fiscal support from the institution, government, or industry, will find it difficult to support graduate faculty and students. Faculty and students, for example, need to attend local, regional and international conferences. Those faculty in the sciences need an infrastructure that enables experimentation to occur. Faculty and students need offices with electronic technology that has the ability to check on one's research, and to collaborate with colleagues at the host institution as well as other individuals throughout the world. Classrooms need to be equipped with the latest technology that is able to improve learning and enhance how individuals interact with one another.

#### *Funding of Students*

How students fund their education has multiple variations. One possibility is that the individual pays for his or her education or takes out loans that need to be repaid. A second possibility is that a student gains a part-time job or assumes work at the university that does not pertain to the specific area of knowledge, but nevertheless helps provide income. A related possibility is that a student takes classes part-time and works either full-time or part-time. Teaching assistantships provide students with a way to learn how to teach, and office-related work within the department may provide additional skills. However, all of these possibilities pale in relation to research internships that enable someone to work with a faculty member, or a fellowship or internship that provides 'real world' experience in the student's area of study.

Fiscal support for a student is paramount. There are, obviously, multiple ways to pay for a graduate education. But if the primary focus is to maximize the learning experience for the student then the individual needs to be able to gain employment in a task related to his or her area of inquiry in general, and dissertation in particular. One initial indicator of quality is to see if the program faculty and administrators have thought about the quality of the learning experience and if they have sought finances to support a student's education.

### *Completion Rates and Time to Degree*

Obviously, if a student does not complete his or her degree, then any indicator about student success is moot. Prospective students are likely to look at whether students complete their degree as one indicator about whether they should attend the program. The cost of graduate education makes it important that when students are admitted the faculty and administration have assumed that the student can be successful. If a student is of marginal ability and is unlikely to complete the program then the investment is likely to be a waste of money. Accordingly, if students do not complete their degree either the program faculty need to rethink who they admit or the program is not providing the necessary support for students to succeed.

A related challenge is how long it takes for students to achieve their degree. Simply because a student receives a degree ought not to suggest that the program is either efficient or effective. Rather, one pertinent question is how long it has taken for a student to receive the degree. Two programs that have the same outcomes but one program takes twice as long as the other to educate and train their students suggests that the processes of one are better than the other. Faculty in different programs have different expectations of what students need to learn before they are ready to undertake the dissertation and defend their work. Students in the humanities, for example, generally spend more time than their counterparts in engineering or education. However, when we compare similar programs we need to ask why one program takes longer, and consumes more resources, than another if the outcomes are the same.

### *Recruitment and Admission*

If one incoming variable is the quality of the students, and one challenge is the ability of recruiting students who are likely to complete the program in a timely manner, then recruitment and admission to the program are significant. Again, a quality program is likely to attract students from around the world in general, and in particular, from institutions other than the host campus. If students from other institutions do not know about the program then they are unlikely to apply, thus it is incumbent on the administration to create an admissions office that enables the program to be known by potential applicants.

Similarly, a high quality program will have specific criteria on which it evaluates whether a student should be admitted. Such criteria are likely to pertain to scores on a test such as the Graduate Record Examination (GRE), undergraduate grades from an upper-tier institution, and a student essay or statement that demonstrates the individual's seriousness and capacity for graduate work. The profile of the student body also should matter. In some countries there has been a concerted effort, for example, to increase the representation of women in the sciences. The individuals who are usually tasked to get a particular group to apply, or to target for recruitment, are admissions offices.

### *Student Profile*

Any country has individuals who are more likely to attend graduate school because they are members of a particular group. In the United States, for example, Caucasian students are more likely to attend graduate school than African Americans. In Australia, Aboriginals are considerably less well represented than their European counterparts. Many countries have racial and ethnic minorities who for one reason or another have not had equal access to a college education, and of consequence, attendance at graduate school.

The same point can be made of any number of any categories – gender, class, disability and the like. The challenge for a country that seeks to level the playing field and ensure equal access to all citizens is to find some sort of proportionality such that individuals who are poor, of a minority racial or ethnic category, or women, are not disadvantaged, much less discriminated against. Such a point is important insofar as a global economy suggests that those countries that will be among the most vibrant are the ones where no particular group is hindered from participating in graduate education.

### *Education and Training*

Two pedagogical methods have been in use for over a century. On the one hand we have had large lecture classes by distinguished faculty. On the other hand we have had small seminars where students interact with a professor on a particular topic. However, technological advances place us on the brink of a pedagogical revolution. The ability for students to learn in a virtual world and to interact in a wealth of manners unforeseen only a decade ago will soon revolutionize how instructors teach their classes.

At the same time, graduate education is heavily dependent on the ability of faculty to mentor students in the cultural mores and structures of the discipline. Such interactions are labor intensive and demand more than simply informal knowledge of how to interact with, and socialize, graduate students. Heretofore, mentoring has been largely an activity that one learns as one does it, and the assumption has been that one can not teach mentoring. Yet we also know that some individuals are better mentors than others, and that students have different needs. Mentoring is a multidimensional activity that calls upon various skills that can be taught to individuals. The challenge is to create the incentives for individuals to learn the skills and to have the time and administrative support to develop such a training program.

### *Knowledge Production and Interdisciplinary Research*

Universities and their colleges and schools are built on our understanding of how knowledge has been produced over the last century. To be sure, some disciplines have been eliminated – phrenology, for example – and new disciplines have been started – Comparative Literature is one such discipline that was largely absent from university curricula a century ago. My assumption is that over the next generation the metamorphosis of disciplines will be even more significant and the transformations will presage deep changes in how we think about knowledge production. Rather than merely an additive approach where a college adds another department or two, what we will see is that individuals will find themselves no longer constrained in their discipline and instead seek ways to work across departments. Whereas departments were the building blocks for a university in the 20<sup>th</sup> century, in the 21<sup>st</sup> century they are likely to be seen as impediments for the effective production of knowledge. Such a point suggests that the structure of the university itself will have to change if it is to incorporate the latest advances in how to produce knowledge. In some respects such an observation may be good news for newer tertiary institutions insofar as they do not have historical structures that may resist the pressure to change.

### *Data and Institutional Research*

A determination of quality necessitates that departments, colleges, universities, and state ministries have accurate, honest, and systematic data that tracks change over time. Most, if not

all, of the challenges that have been outlined here depend upon an understanding of how the organization performed in the past so that it might set goals for the future. Further, the organization needs to benchmark its own departments against similar departments at other institutions as a way to determine whether quality has been reached or what needs to be done in order to reach it.

Quality is not a goal that is achievable simply because one wishes to have a premier department or graduate program. As I noted at the outset of this article, because graduate education is expensive, it behooves us to understand whether our offerings are improving and if they have the possibility of being among the best in the country and/or the world. Not every program at every university can be one of the top ten programs in the world. But what is the goal of a particular graduate program? What does it need to do to achieve that goal? The answer to such questions necessitates objective data rather than simply the casual opinions of the actors involved in the undertaking.

### Best Practices

Given what I have outlined, what might be steps toward quality? There are five actions that have found broad agreement for those who have investigated graduate education.

#### *Determine Priorities*

If a concern for quality is paramount then those who direct universities need to recognize that excellence in graduate education can only exist in certain areas. The costs and demands of graduate programs are too great for any university to assume that every department or discipline can or should have a doctoral program. The result is that vice chancellors and rectors need to engage in rigorous evaluation about the costs of a program and the ability of a program to achieve quality within a finite period of time. If there is no possibility, then the program should not be started, or if it already exists, it should be phased out.

Obviously, not every program needs to be, or can be, among the top ten programs in the world. Conversely, every university does not need a doctoral program in every department. Although both ends of this continuum are easy enough to agree on, the challenge becomes determining where a specific program lies and what should be done. In a small country such as Malaysia, for example, there is no possibility that the resource requirements for a quality biochemistry program can be achieved in two universities, much less in every institution. Thus, decision-makers need to make difficult choices about where the resources for such a program might be directed. In a large country such as India there may well be a need for several doctoral programs in business administration, not all of which will be among the best in the world. Business administration is a relatively inexpensive doctoral program, and in an economy that is booming there may well be a need for several managers who hold terminal degrees.

Such observations highlight my initial comments about the interrelationships across key constituencies. Faculties and administrators are best able to judge what they can reasonably offer on a campus; the state is generally the provider of the resources and has a major role in determining system priorities; and the business world should have a significant voice in making the case for what sorts of needs exist or will exist to advance the economic well-being of the country.

### *Set Goals for Student Development*

The primary ‘commodity’ of any program is the students. They need to be nurtured and analyzed before, during, and after, their academic careers. Administrators and faculty need to set standards for the kind of students who should be admitted and what the expectations are to ensure that they will succeed. Success is not an undertaking that is entirely dependent upon the individual. I have outlined the multiple challenges that exist in any program in all universities. Students need fiscal, social, and intellectual support structures that enable them to succeed. We know that part time students are less successful than full-time students in terms of completion rates and assumption of faculty positions; we know that students engaged in work that is directly related to their area of inquiry is more beneficial than work that simply provides fiscal support; we also know that students benefit when they interact with their colleagues and their faculty and that mentoring is more than simply a useful activity for some students by some faculty. All of these sorts of observations provide the criteria upon which a graduate program can build quality and assess success.

Quality also pertains to the sorts of jobs students take when they graduate from a program and how they perform in the job. One key indicator of quality is if a significant number of students assume faculty positions in research universities, and if they gain the portfolio of a successful professor. Obviously not every student will become a member of the faculty in a research university, and many will be successful in different walks of life. The most important point, however, is that the university is clear about what it believes are standards of success for its graduates and it helps them achieve that success.

### *Increase the Quality of the Faculty*

If students are the primary ‘commodity’ of the program, then the faculty are the main creators/developers. We can choose superb students, but without superb developers the commodity will not be of high quality. Simply stated, a farmer may choose good seeds for the garden, but if the farmer does not know how to till the field, nurture the garden, and grow the seedlings the crop will be of little value.

Faculty who teach graduate students need to be successful in their chosen field of research. Although there are multiple criteria one might employ to analyze success, the common indicators are where the individual received the terminal degree, the amount of research that has been accomplished and recognized by way of external funding, publications in premier international journals, presentations at juried conferences, and awards and honors that have been garnered. I also have inferred above that faculty need to be cognizant of their role as teacher and mentor and be able to interact with their advisees in a manner that brings forth the best possible work.

### *Develop Organizational Structures that Foment Innovation and Engagement*

Individuals, whether they be students or professors, must operate within an organizational structure that is defined by cultural mores and histories. Most organizational structures are devised to regulate activity. There are, of course, good reasons for rules that orchestrate how a group of actors accomplish tasks. The problem is that structures often can be so rigid that they perpetuate ineffective and inefficient activities at a time when innovation is paramount.

I have suggested that traditional disciplines are likely to go through greater change in the 21<sup>st</sup> century than at any time in the past century. If the university is going to respond in a manner that foments change then the structures that encapsulate knowledge need to be organized in a way that enable change. A combination of informal and formal activities needs to be arranged such that “the way we do things around here” is not an excuse for maintaining the status quo. An innovative organization is fundamentally different from one that suffices with stasis. If we are to develop quality in graduate education, then departments, schools, and colleges have to be structured in a way that calls for interaction across the key constituencies that I outlined above. Notions of ‘steering from afar’ where ministries define what is and is not to be done will be augmented with actions that enable more decision-making at the local level. Faculties that simply want to repeat courses without significant changes based on the revolution in knowledge production, learning, and teaching will come to understand that clear indicators of success have to be implemented so that they are able to determine if ambitious goals are being reached. Such suggestions are as much cultural as they are structural changes in university life. Of consequence they require enlightened leadership from rectors, vice chancellors and state policy makers.

### *Maintain Rigorous and Systematic Data*

If individuals are central, and structures provide the ability for those individuals to succeed, then the final key ingredient is that there is consistent, impartial, and high standards of analysis and evaluation. Change and improvement are always possible. The way to ensure that a program is of high quality is to engage in on-going evaluative activities that compare one comparable program with another. Annual reviews need to occur and when change is necessary then it needs to be implemented based on empirical data.

Many organizations collect data but they do not make any use of what has been found. Simply to collect data and then ignore it is a waste of time and resources. The point of data analysis is to gauge where changes are needed and what the short and long term goals for the unit are. Evaluations should have consequences. Departments and faculties that are able to demonstrate excellence should be rewarded, and those that are consistently weak and show no signs of improvement need to be considered for radical overhaul or elimination. Quality in graduate education is not ephemeral. I have outlined here challenges that exist and ways to analyze and overcome these challenges. Data are central in enabling the various constituencies to create the conditions for success.

## **CONCLUSION**

Any nation has several priorities, as does a university. The safety, health, and economic well-being of a nation are paramount. For over a century there has been general agreement that a well-educated citizenry is a necessary ingredient for the success of a nation. Over time we have increased our understanding of what is meant by ‘well-educated.’ A century ago a high school degree was an ambitious goal for a nation to set for its citizens, and at the start of the 21<sup>st</sup> century many will agree that such a degree is no longer sufficient for a country to remain competitive in a global economy. No one argues, however, that everyone needs a doctoral degree, but many will need more than a high school degree.

Graduate education is of a different matter. Although not everyone needs a graduate degree, a country needs a research and professional infrastructure that graduate education provides. I pointed out here how the undertaking is expensive, finite, and circumscribed for a

chosen few students. Nevertheless, for many of the same reasons that education is important to a country, graduate education is a national imperative. Those who have terminal degrees are able to conduct research that is vital to the nation's interests, and they are able to train the next generation of scholars.

How we evaluate graduate education differs significantly from how to evaluate other forms of education. I have outlined a schema for evaluation, the challenges that exist, and the principal actors that should be involved in evaluation. One key summative point to take from this analysis is that to ignore whether a particular program is of quality places not merely a handful of students in that program at risk, but it also shortcuts the ability of the nation to succeed. The challenge, then, is to set high standards for graduate education, and then provide on-going analyses that enable these goals to be met.

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