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**Assessments in Support of
Graduate Education and Research**

East Carolina University

**Prepared by
Yardley Research Group**



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Introduction and Methodology

In March 2006, the Vice Chancellor for Research and Graduate Studies at East Carolina University contracted Yardley Research Group to conduct a strategic assessment of the University's doctoral programs, in order both to benchmark them against cognate programs in the University's institutional peer group and to introduce to the faculty the plan for the National Research Councils' national assessment of research doctoral programs. The specific purposes of this analysis are to:

- define the competitiveness of each participating program in relation to a cohort of institutions selected by the University and identify steps to increase program competitiveness;
- suggest long-term strategic priorities that strengthen, realign for development purposes, or otherwise improve prospects for graduate study and research at ECU;
- estimate enrollment capacity for doctoral and master's programs; and
- propose possible new graduate programs for the University that are both marketable and feasible.

The methodology we used to complete the doctoral assessments evaluates a program's own sense of its strategic direction and competitive position in light of comparative data on similar programs at peer institutions. While in practice the various stages of the methodology overlap one another, it is convenient to think of the work as taking place in distinct phases.

- *Phase I—Interviews:* During the week of April 2, 2006, Yardley Research Group personnel¹ conducted on-campus interviews with directors of graduate study of the doctoral programs participating in the study, as well as the relevant department chairs. At the same time, we also interviewed faculty representing proposed doctoral programs in various stages of development. Faculty interviews related to existing programs focused on enrollment trends and analytics, recruiting activities, the program's own sense of their competitive strengths and weaknesses, especially related to academic research, and strategic initiatives to improve program standing.

Faculty interviews for proposed programs mirrored the process and criteria by which the University of North Carolina system evaluates new degree proposals, and sought to relate the proposed program to institutional mission and strategies, explored how existing resources could contribute to program development and how gaps could be addressed. In addition, we explored faculty research interests and scholarly achievements, infrastructure requirements, including library holdings, market demand for the program, plans for competitive indicators such as stipends, and plans for the ongoing assessment of the program.

For background purposes and in order to discover institutional strategic intent, we also interviewed the Deans of each of the participating colleges and some of the University's senior administrators, including the Chancellor, the Provost, the Vice Chancellor for Research and Graduate Studies, and others.²

¹ CEO Michael Ditchkofsky and Vice President Louise Williamson. Senior Consultant Nancy Diamond had a scheduling conflict for the visit but joined us in our analysis.

² Questionnaires for each of these interviews are included in Appendix A: Interview Protocols.

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- *Phase II—Selection of Institutional Cohort:* In collaboration with the Vice Chancellor for Research and Graduate Studies (VCR), we selected a cohort of ten institutions for comparative purposes. To select the group, we worked with several lists—ECU’s newly developed list of peer institutions, the 2006 Carnegie Classifications, and two lists based on queries we conducted on data from the Integrated Post-Secondary Education Data System (IPEDS) of the U.S. Department of Education.³

The first query identified institutions that, for the most recent three-year period for which data was available, spent within 20% of ECU’s instructional expenditures. The second query identified institutions that spent within 20% of ECU’s research expenditures. We chose the final list of comparator institutions with a view to establishing aspirational benchmarks for the University. As we will discuss in more detail below, it was impossible to find within the cohort an adequate number of cognates for some programs. In those cases, we went outside the initial group of 10 benchmarks, giving preference to institutions in the official ECU peer group.⁴

- *Phase III—Selection of Program Cognates:* Once we selected the comparative cohort, we then reviewed catalog copy and other published descriptive information in order to choose benchmark programs for each ECU doctoral program participating in the project. In choosing, we paid particular attention to credentials offered, program curricula, and faculty research. This allowed us to compare programs that, whatever their official names, were similar in content and strategic intent.⁵
- *Phase IV—Productivity Comparisons:* We assessed each program on the basis of productivity indicators that we anticipate will be used by the NRC in its upcoming assessment of doctoral programs.⁶ These data are divided into the following groups:
 - Data related to program size, including the current number of FTE faculty⁷, the average doctoral enrollment for the previous three years, and the resulting doctoral-student-to-faculty ratio
 - Data related to students, including in all cases the number of doctoral degrees conferred in the five year period from AY 2000-01 through 2004-05.

³ Results of these queries are provided in Appendix B: Instructional and Research Peers.

⁴ The final list of benchmarks for the project, usually referred to below as the “comparative cohort,” includes Florida International University, Northern Illinois University, Ohio University, Old Dominion University, University of Missouri Kansas City, University of North Dakota, University of South Carolina, University of Wisconsin Milwaukee, Virginia Commonwealth University, and Wright State University. As we have already indicated, we were often compelled to go outside this cohort in order to find program cognates. Institutions used most frequently for these cases include Florida State University and the University at Buffalo, though in all, 42 additional universities figured into the study.

⁵ A list of comparator programs is available in Appendix C: Taxonomy of Program Cognates.

⁶ This data is summarized in Appendix D: Comparative Program Data. We detail the sources of data fully in Appendix D, but for the most part, the source of data is the universities’ office of institutional research.

⁷ In all cases, we asked for the number of FTE faculty who are either designated as graduate faculty or who are currently active in training doctoral students. (We did not count non-graduate faculty or non-tenure-system faculty.) The universities’ calculation of FTE are derived from the varying teaching load requirements of each university and, in those cases where joint appointments are possible, the percentage of faculty time devoted to specific doctoral programs. Formulae for calculating FTE differ from institution to institution.

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(Figures for 2005-06 were, for the most part, not available at the time of data collection.) For many programs, we also include average GRE scores, though institutions were inconsistent in the way that they record scores. Some institutions record verbal and quantitative scores; others record only the total score. For verbal, quantitative, and total scores, we use a three-year average (AY 2002-03 through 2004-05). For analytical writing scores, we use a two-year average (AY 2004-05 and 2005-06), since using earlier years would require us to convert from the old method of scoring.

- Data related to faculty and research, including total average annual research awards⁸ for the period AY 2000-01 through AY 2004-05 and papers published and citations received in periodical publications for the same period.
- Data related to program competitive quality and practices, including net assignable square footage of research space, degree of tuition remission, the customary duration of the graduate stipend, the average amount of the stipends, the degree of subsidization of student and dependent health insurance, and the average time-to-degree for the five-year period from AY 2000-01 through 2004-05.

We will detail the methodologies for assessing enrollment capacity and determining new program marketability and feasibility in later sections of this document. Before turning to the assessments of the doctoral programs themselves, we want to delineate some general observations that became apparent during the course of the study and that cut across specific programs.

⁸ We prefer awards rather than expenditures, since awards are the best indicator of current research prowess.

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Assessment of Existing and Proposed New Doctoral Programs

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General Observations and Recommendations

We begin by noting that East Carolina University is in an exciting time of transition as an institution and that, not surprisingly, such transition is being mirrored in particular programs which, after an apparent period of stagnation, are moving in the right direction. A new central administration is bringing vitality to the institution, engaging faculty and staff for the first time in integrated strategic planning, which features a budget planning process that above all values transparency. During our time on campus, we saw no shortage of excellent and innovative ideas, particularly in health-related areas, and we believe that the institution is evolving a world-class academic medical center that is on the verge of particular distinction in several areas of research that are important both generally and to the region which the University serves.

Many of these transitions, obviously, are reflected in the University's doctoral programs; but we are concerned that the historical development of those programs is problematic in several senses, and that, from the point of view of a highly functional research university, they exist in a context of cultural, structural, and infrastructural deficiencies that require significant institutional change and in a climate of bureaucratic impedance that is hostile to the conduct of doctoral education and research, particularly in the biomedical sciences.

Of the University's 17 existing doctoral programs (excluding the consortium degree in technology management), a significant percentage have been launched within the last 10 years—six programs were begun in 2001 or later, another five were started between 1996 and 2000, and six were founded prior to 1995. Under a previous central administration, in fact, the University pursued an aggressive campaign of doctoral program development in order to earn the greater per-student allocation that the state provides for doctoral students. Our concern is that the University appears to have developed these programs without an adequate understanding generally of how much doctoral programs cost to run and specifically that the per-student allocation from the state is not enough to support a doctoral student.

It is not simply a question of student support, however. One program—Health Psychology—though it launched officially last year, was at the time of our visit considering not accepting students for the 2006-07 academic year because the department lacked faculty who could supervise a doctoral dissertation. At least one other program—Medical Family Therapy—launched not only with insufficient qualified faculty, but with inadequate funds for student support and a lack of both the clinical and research space needed to support the program. Our sense is that the University embarked upon program development with neither an adequate understanding of start-up costs nor a reasonable assessment of barriers to entry—to the extent that those barriers, in several cases, continue to exist even after the launch of the program. In at least one case, though we think that the program is a wonderful idea and that its research output is sorely needed in the region, we wonder if the University will decide that it can afford both the start-up costs to operate the program competitively and the ongoing investment required to support the faculty vision of community engagement.

Moreover, the choice of some programs for development strikes us as odd and, in several cases, constitutes a high risk for the University. In an effort, perhaps, to avoid the objection during the state approval process of duplicating programs, faculty settled upon a kind of development by synecdoche, substituting a narrow sub-specialization for the field itself—so that ECU has bioenergetics rather than exercise and nutrition sciences, medical family therapy instead of marriage and family therapy, and technical and professional discourse rather than English or communication. This kind of development has several consequences.

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During the course of our practice, we have encountered several programs of this type, in which a faculty orientation is institutionalized as curriculum and becomes the entire program. Even though the research or epistemological orientation of the faculty is a principal selling feature and—frequently—a strength of the program, its expression as curriculum ultimately means that the program never finds an audience, since students fear that what appears to be overly narrow specialization will limit their employment prospects. Hence, most students opt for Exercise Science rather than Bioenergetics, for example.

We think that this problem will be especially acute at ECU for another reason. In many instances, faculty choice of program shape or focus has placed the ECU program in a uniquely uncompetitive position. As we indicated in our discussion above of the methodology for this study, the odd shape or configuration of programs at ECU forced us to search outside the comparative cohort for similar programs. Frequently, we found cognates only at some of the country's foremost research universities—to find Medical Physics, we had to look to Purdue, UCLA, Minnesota, and Wisconsin; to find Health Psychology, we turned to Duke, Stony Brook, and Florida; and to find Medical Family Therapy, or the closest match to it, we had to go to some of the country's foremost land-grant institutions: Iowa State, Michigan State, Purdue, and Minnesota.

Such choices will obviously lend a negative cast to these particular program assessments, but the more important point is that when looking for programs in Medical Physics, for example, prospective students will be comparing the ECU program with those at the institutions cited above—and there they will find faculties more than twice as large as the one at ECU, research earnings—and consequent student research opportunities—nearly 20 times larger than those at ECU; and faculty publication records that dwarf ECU's by 15 or more times. We project, as a result, that the ECU programs will struggle mightily with enrollment targets and will be forced to take students of a caliber that will neither raise program research profiles nor result in distinguished post-degree placements. In some of these cases, we are dealing with program choices that could very well be pioneering for their fields, but we think pioneering a new discipline is a very high-risk financial strategy for ECU. Our sense is that faculty choices are more likely the result of particular cultural issues which the University will need to address if it is to move forward in a way that makes financial sense.

The national reality of decreasing state support for higher education and the concomitant increase of self-supporting activities from faculty have not yet gained currency among many faculty at ECU. As we spoke to faculty and administrators during our campus visit, it became clear that there was little sense—outside the central administration—that programs are responsible for supporting their own graduate students. We use the word “graduate” deliberately, for many programs state frankly that it is the state's—and hence, the Graduate School's—responsibility to provide support even for master's students.⁹

In fact, there appears to be little agreement that research is among the primary functions of faculty. This is, perhaps, connected with the University's double legacy as a teacher training institution and a community-based (that is, non-research) medical school. We observed a frequent tendency in faculty speech, in curriculum design, and even in strategic discussion with the deans, to separate research from other legitimate endeavors. Too many programs, for example, feature separate research and clinical tracks; and some faculty tend to believe there needs to be a choice between “traditional” research and community engagement. More than anything else, the University needs to navigate a cultural shift in which faculty come to

⁹ We have, in fact, never encountered anywhere such a complete absence of the notion that one of the principal roles of master's programs is to generate tuition revenue.

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believe that externally funded research is among their primary job responsibilities and that their doctoral students need to be trained and funded out of that same research.

In many instances, the University is faced with a chicken-and-egg dilemma in initiating this shift. Some of the deans admit candidly that faculty in their colleges are “nowhere” with active research programs and insist that, consequently, they need research assistantships from the Graduate School and other financial resources from the VCR in order to seed faculty research. Some seed funding is inevitable, but we would feel more comfortable with this notion if all the deans were to approach this question as the Dean of the College of Technology and Computer Science does—that internal funding is an investment that must be returned to the University within a particular period of time and that internal funding provided by any mechanism is tied to expectations of particular levels of research and other productivity. We think it is also important that the University move quickly to hire a permanent advancement and development staff.

To be fair, there are several serious infrastructural issues that need to be addressed at least simultaneously with the launching of a research culture. The first is that the teaching load for doctoral faculty needs to be reduced—probably to 2-2, based on our experience elsewhere. Second, the University needs to set up a system of metrics and annual unit reports that encourage activities important to a research university. During our data collection for this study, we had the opportunity to consult the academic unit report system developed by the Office of Institutional Planning and Research. This system appears to be operating well and certainly tracks many of the required elements—faculty publications, etc.—but has several important deficiencies.

First, it is not sufficiently integrated into whatever system is used by the Office of Sponsored Programs to track grant proposals, awards, and expenditures. Second, at least some of the reporting that feeds the system is either voluntary or inadequately enforced.¹⁰ The more serious issue, however—and this is an issue with the Sponsored Programs system as well—is in the way the system defines “academic unit.” For the most part, tracking happens at the level of departments—so that it is difficult, for example, to track research awards at the level of an interdisciplinary doctoral program.¹¹ It is not our intention to call attention to system deficiencies per se but to point to the need to begin tracking performance measures in a way that is more conducive to the conduct of doctoral education and research. We recommend the development of a system that defines “unit” as the individual faculty member.¹² In such a system, various codes can be assigned flexibly so that the University can track cost, revenue, and other kinds of productivity however it desires. For example, an individual faculty member can be coded so that (s)he is a member of a program, a department, a college, an overarching research initiative such as obesity care, or any other larger group of faculty which the University is using to accomplish some strategic purpose. Such a system would foster the development of a culture in which a primary job function of faculty is to conduct

¹⁰ We encountered an incident in which a department had not entered all of its faculty publications into the appropriate database for annual review purposes, and the University administrator with whom we discussed this indicated that the failure to observe this required practice is fairly routine.

¹¹ To obtain research awards attributable to the Coastal Resource Management program, for example, at least four people had to discuss the question over a period of several days, and the discussion included territorial tensions.

¹² We do not mean by this the re-development of technical systems but the re-definition of terms in the current system, with “individual faculty member” replacing, for example, “department” as the definition of unit.

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funded research that supports both University strategic initiatives and individual doctoral students, in which individual job performance and institutional progress toward strategic initiatives are measured, and in which resources can be strategically aligned.¹³

We think that infrastructural issues are not the cause of an insufficient research culture; they simply confound it. Because the comparative cohort for this study is so fragmented (for the reasons we have discussed), we were unable to benchmark specifically the percentage of grant proposals that result in funding. Our experience in the field, however, indicates that the conversion rate at ECU is unusually low, and the kind of analysis we are performing here is unable to indicate why. It could be simply that faculty require professional training in terms of proposal development, which is easily provided. It is probable, especially in the newer programs, that the funding agencies simply do not see a level of research activity in the institution to give them a sufficient comfort level; but it is also possible that faculty research is not yet grant-worthy in itself, which is a more serious cultural issue that needs to be addressed in several ways.

First, we think it is important that the University jump-start its research program by hiring senior faculty leadership in the areas it deems most important. Second, a significant portion of seed money for research should be reserved for senior hires, with the stated expectation that faculty who receive start-up funds need to return that investment within a particular period of time and need to generate consistently several times their annual salary and other costs after that.¹⁴ Third, it should be a routine part of periodic program reviews for visitors to review grant proposals and comment on their effectiveness. Naturally, we assume that visitors should be distinguished and productive scholars in their fields.¹⁵

It is not surprising that the University's infrastructure for research development is itself in need of development, since the University's research mission is, after all, relatively new. We think, however, that the advancement of the University's research culture is impeded by two principal factors, one of which is an *over-development* of infrastructure, in several senses.¹⁶ We have already noted that systems and reports tend to track by department, and this is no accident: the department itself looms large in the ECU collective consciousness, so to speak, since the department is the chief entity through which resources are allocated. Our direct experience during this study is that alternative structures, such as institutes, function in precisely the same way—as channels for resources; and because of this, they are less effective in doing what they do at other research universities: bringing faculty together from the various resource channels so that they can pursue a particular research agenda or accomplish some other strategic purpose.

¹³ If this system could be integrated into the budget planning process, it would help to at least examine many issues. Many faculty complained to us, for example, that they have no real incentive to conduct research. We are unable to judge the legitimacy of this complaint, but the kind of system we have described would enable the University to examine, for example, indirect cost allocation on a number of levels so that it could be benchmarked against standard practice in the field.

¹⁴ This is becoming standard practice in many universities.

¹⁵ Many faculty lamented that too few of their proposals are funded, though in several cases noted below, we think the issue is that their pipeline is too small—that is, they are not submitting enough proposals. It is curious to us, however, that most faculty seem genuinely mystified about why their proposals go unfunded. Is it possible that it is not routine procedure for faculty to see reviewers' comments? We think it is important for the VCR to conduct a review of recent proposals to see if anything can be learned.

¹⁶ The other factor is legacy.

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It is our observation that there is an over-abundance of “resource channels” at ECU. There is certainly significant repetition at the program level. There is a proposed program, for example, in Health Intervention Science, a growing strength of the University. Our point, however, is that the content of this program will overlap significantly with both the program in Bioenergetics and the program in Rehabilitation Counseling and Administration—three programs, each with its own administrative infrastructure. This kind of overlap is repeated at higher levels: a college of health and human performance which overlaps significantly in scope with a college of allied health sciences; and, for that matter, there are four separate colleges that relate to human health. While we are not making recommendations related to the specific programs and colleges mentioned here, we do need to raise the possibility that in order to develop the infrastructure it needs for doctoral education and research, the University may need to eliminate some of the redundant infrastructure it currently has.

This is not simply a question of efficient administration. This is a fundamental anomaly the University will need to solve: in order to avoid duplication of existing programs in North Carolina and to pursue a doctoral and research agenda with a restricted budget, the University will need to develop *inter-departmental* doctoral programs that serve as a vehicle for interdisciplinary research—this in an institution that is currently focused on administrative units and is preoccupied with a host of *factors of separation*—departmental resources, budget, faculty organization, assigned space—none of which is conducive to interdisciplinary research. In a very real way, establishing a viable culture of faculty research means changing the whole way the University assigns credit, allocates resources, and administers rewards and penalties. To do this, ECU will need to focus the entire institution on *factors of integration*, and it is quite possible that one of the means to do this will be to eliminate internal redundancy—to say nothing of artificial barriers.

We need to address another kind of over-development of infrastructure that is impeding the advancement of the University’s research culture. In nearly every one of the 42 interviews we conducted on campus, we heard alarming reports of a bureaucracy spun out of control—to the extent that major initiatives negotiated at the decanal level and approved at the vice chancellor level are brought to a complete halt by relatively junior-level employees—usually on the grounds that they violate some policy or procedure imposed by the state of North Carolina. The “Code”—and all its variations by college and type of employee—hovers over virtually everything the University attempts to do, from large strategic initiatives to ordinary mundane tasks, sapping significant time, energy, and political will that could be devoted elsewhere.¹⁷

On several occasions both during and after our visit to campus, we spoke to various faculty and other personnel about some possibility we had conceived—only to be told that the Code would make it impossible to pursue such an action. We have not read the Code in all of its iterations; but we have read significant parts of it—those parts that purportedly nullified our ideas—and we believe that the source of bureaucratic obstacles to strategic initiatives at ECU is local interpretation of state requirements—and not the requirements themselves. We think it crucial for the health of the institution that the Chancellor order an external audit of all policies and procedures related to accounting, hiring, and executing contracts. The audit should extend down to employees at the lowest level; and the auditors should adopt as standard procedure that they demand to see the precise relevant policy or regulation every time they are told that something must or must not be done in a particular way because of state requirements.

¹⁷ We cannot overestimate the seriousness of this issue. Discussion of it took up nearly 60% of the total time we spent with deans and senior administrators at the University.

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Part of the theme we have been developing is that a large part of the cultural shift that needs to take place at ECU relates to the University budget, which played second fiddle in our interviews only to bureaucracy. In general, those on the East Campus prefer to have the budget scenario of those of the West Campus, who prefer to have the scenario of those on the East Campus. Everyone complains that the budget is baroque and impenetrable. We know that current senior administrators are going a long way to make the budget process transparent and we are not in a position to judge whether it is over-complicated, but it is clear that faculty are preoccupied with budget—in an unhealthy way. Perhaps because resources are scarce, there is a tendency to engage in hoarding and empire building, as we have already indicated: “Something must be paid for out of the university budget, not out of the department’s.”; “It is important for this program that it have its own dedicated space that no one else uses.”; “This money is attached to this administrative entity and cannot be attributed elsewhere, even for analytical purposes.”

The part of the budget we have seen—that part related to graduate student financial support—was largely determined in the past by legacy. We will discuss this more fully when we turn to the Graduate School, but the point we wish to make here is that in discussing assistantship support with programs, we discovered that there is a frequently occurring practice in which, apparently feeling that the Graduate School is not providing adequate support, deans will take funds allocated for something else (usually faculty lines that have not been filled) and use them to fund assistantships. This practice troubles us for several reasons.

The one relevant to this discussion is that this is a sign that spending is primarily operational rather than strategic. In order to move forward on a strategic research agenda, we think the University will need to set aside significant funds to build strategic areas and then will need to be sure that those funds are in fact spent on those areas. Perhaps the most difficult part of the cultural shift is that there will need to be more centralized control of spending than that to which faculty and administrators are currently accustomed, but we see this as crucial. In our opinion, it is characteristic of a viable research culture that funds are allocated strategically and then spent as budgeted on the purposes for which they are allocated. It is also our opinion that “cushions” or reserves should be restricted to senior administrators. This assumes, of course, that there is a consensus among deans and senior administrators about institutional strategic priorities.¹⁸

Given the problematic history of doctoral program development, including the failure to plan for significant start-up costs, as well as faculty assumptions about graduate student support and the factors of both legacy budgeting and operational spending, our principal concern for East Carolina University is that there is not currently a rational and viable financial basis for doctoral education. Therefore, we think it is urgent that the University develop a comprehensive enrollment management plan that will govern in detail operational and strategic spending for the next five years and that will lay the groundwork for spending for the five years beyond that. Such a plan should be grounded in the long-term strategic priorities of the University and should be informed by explicit policies that express the consensus of the deans and senior administrators about acceptable levels of spending and non-financial values in particular areas. The plan should include the following elements:

¹⁸ The other reason that we are troubled by operational spending in this area is equally important: our general experience is that when graduate assistantships are administered outside the Graduate School, the balance between the pressure to cover instruction and the need to provide meaningful professional experiences that contribute to a student’s doctoral education is often jeopardized.

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- an accurate accounting of existing and potential income for particular academic units, including state per-student allocations, actual tuition revenues, external research grants (probably expressed as indirect cost allocations), income from service contracts and clinical trials, student fees, and income generated through University or College Advancement, and endowment-generated income (if applicable)
- an accurate accounting of actual and projected operational and strategic expenses, including salaries and benefits for tenure-system faculty, fixed-term instructors and adjunct professors, graduate assistants, technical and research staff, and clerical staff; competitive tuition support for GAs; competitive start-up packages for new faculty; physical infrastructure; equipment maintenance; and marketing
- the resulting Income/Expense (I/E) ratios. (It is important to note that acceptable I/E ratios (whether positive, negative, or zero) are governed by institutional policy. The University may decide that the non-financial value associated with a particular unit is high enough to warrant a negative or zero I/E ratio. Strategic budgeting assumes that I/E ratios differ by unit and change over time.)
- operational assumptions and strategic goals of the unit plotted out over time, but these must always be expressed in terms of their effect on the I/E ratio.

It is probable, given the state budgeting process, that income will need to be expressed in part by student credit hours (SCH). We think it will be helpful to plot out SCH for both major students and non-major students by unit, since an accurate picture of service instruction may alter the way the University charges units for general allocation. We assume that both the institutional budget and the enrollment management plan will reflect institutional strategic intent.

Before turning our attention to the Graduate School itself, we have a final point on cultural issues. A number of the faculty with whom we met speculated whether the University (and hence, the region) could become a more modest version of the research triangle that dominates the state economy. We think this is the wrong question to ask because it indicates adherence to a particular model of higher education that will not likely be possible for ECU: the large comprehensive research university in which excellence is derived partly from faculty size and partly from contributing, through original research and by preparing the future professoriate, to the development of the traditional academic disciplines. Adherence to that model has extensive implications that effect virtually everything in the University—especially faculty hiring. In that model, the operating principle is to hire one or two faculty in every possible area in a field—both in order to be comprehensive and in order to cover instructional needs—with the consequence that no single area achieves critical mass.

ECU will never be the University of North Carolina at Chapel Hill or NC State or Duke University. This does not mean that excellence is impossible for ECU. In fact, we think it possible in the near term for ECU to become internationally recognized for its metabolic research, especially in terms of the treatment of obesity and diabetes, and for its work in rural medicine generally. The University has achieved this precisely because it developed (by plan or otherwise) research foci that are crucial for improving the quality of life in its particular region, and we think that this is the key to distinction for ECU: to build concentrated research excellence in areas that have immediate regional impact and to focus intently on those areas.

The necessary by-product of intense focus is that other areas are held necessarily in a kind of receivership, especially if they have not yet developed the ability for self-support through grants or service contracts. We think that this, along with more centralized control of the budget, will be the most difficult part of the University's cultural shift since, as we have

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already discussed, the University currently has a culture focused on rigid separation of units. For ECU, the achievement of critical mass will be achieved through interdisciplinary collaborations, joint hirings, and other mechanisms that support interdisciplinary research focus. It will not be achieved by building comprehensive departments.

An ironic result, we think, of adherence to the ideal of the comprehensive department and its concomitant resistance of collaboration is that the practice of the disciplines themselves becomes outdated. We believe this to be a serious issue for ECU, especially in the Brody School of Medicine, where concern for the erosion of traditional disciplines has had the unintended consequence of outdated faculty approaches to biomedical science. It is possible that this factor plays an important role in the University's generally low award to proposal ratio.¹⁹

One of the key strategies for increasing the research culture at ECU is to increase the functionality of the Graduate School itself, which has suffered from a lack of strategic direction under prolonged interim leadership.²⁰ The Council of Graduate Schools has laid down ten broad functions of graduate schools²¹; but of greatest relevance here is that graduate schools play a central role in coordinating the development and ongoing evaluation of programs and in recruiting, admitting, and monitoring the progress of graduate students toward their degrees. The current Graduate School is active primarily in terms of students, though not strategically so, and so far as we can tell, it has had little role in the ongoing development of programs. From our point of view, a strong graduate school would play the central role in the coordination of proposals for interdisciplinary training grants—the award of which would be a major step forward for ECU.

In terms of students, we are concerned, first of all, that the pool of applicants to doctoral programs is quantitatively and qualitatively inadequate—most programs have acceptance rates of 50% or more and, for the most part, incoming GRE scores are not higher than the 50th percentile. The Graduate School needs to develop a plan consisting of centralized—that is, Graduate School initiated—actions and program activities that will increase the quality of incoming students over time. Part of the plan should be to improve the timeliness of the admission cycle. Currently, admission offers with assistantships are made too late in the spring for the University to attract the best possible students. Similarly, the Graduate School needs to address the question of graduate student health insurance, which is currently offered only to students in the Brody School of Medicine. Our sense is that, in order to be competitive at all, institutions need to subsidize health insurance for students by at least 50%, though many graduate schools routinely offer full subsidies for both students and dependents; and we expect that the minimum level of competitiveness will increase as time goes by.²²

¹⁹ We observe a curious dichotomy in this regard. By instinct, faculty who have developed doctoral programs have created programs that, in terms of content, do in fact cross the traditional disciplinary boundaries. Except for those areas in which the practice of a discipline is outdated, resistance to collaboration is administrative, not scholarly.

²⁰ Since our visit to campus, the Vice Chancellor for Research has hired a new Graduate Dean, and we expect this will make a major difference for the University.

²¹ in Daniel Denecke, Ed., *Organization and Administration of Graduate Education*. Washington, DC: Council of Graduate Schools, 2004.

²² We are not, however, advocating full subsidies for students and their dependents, which several programs felt should be the case, since their doctoral students tend to be adults. In our view, graduate stipends and health insurance are not meant to support families, and we don't believe that ECU needs to go this far to be competitive.

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Under interim leadership, the Graduate School developed a number of uncompetitive practices related to graduate student funding. As far as we can tell, the allocation of GA funds has been determined by legacy and is appropriate to an institutional academic profile and levels of state funding that are far in the past. The most recent figures we have available to us indicate that 68% of assistantship funds are spent on master's students, with only 15% of funds available to doctoral students. (An additional 15% of funds are spent on "other" students,²³ apparently including, at one point, certificate students. This is a profile not worthy of a research university and needs to be changed. While we recognize that certain programs in the liberal arts and sciences have heavy service instruction loads that need to be satisfied by non-tenure system faculty, we think that the priority for funding should be doctoral students first and then academic master's students.²⁴ As we have already indicated, master's students in professional programs, such as business, education, communication, etc., should be expected to pay tuition, either full or discounted as a means to attract students, since this is standard practice nearly everywhere.

In our view, the task force on the funding of graduate education chaired by Associate Vice Chancellor Paul Gemperline had made an excellent beginning in sorting out ECU funding practices, and we want to endorse and carry further the committee's recommendations made in its report of October 25, 2004. Specifically, we believe that the Graduate School's practice of offering administrative assistantships—in which students are paid to perform clerical work in various department offices—should be abolished, since clerical work does nothing to contribute to the student's educational experience or professional development, which is the principal purpose of a graduate assistantship. For the reason discussed above (on page 12) and because it also jeopardizes the balance between the education and professional development of students and the workforce needs of departments, we recommend that various deans' practice of using lapsed salary funds for additional graduate assistantships be avoided. The experience of the field is that students perform better and benefit more when their assistantships are administered by the Graduate School.

We also recommend that the Graduate School pay much more attention than it has in the past to the question of professional development. First, it needs to develop and implement professional development programs for students—in such areas as pedagogy theory and practice, grant writing, job searching, etc. Second, we think there is a strong need for both orientation and ongoing professional development of graduate program directors so that the University can be certain that their activities and the advice they give to students conform to best practices in the field.²⁵

²³ It is an established practice in many units to hire graduate students from other programs with unit funds as part-time hourly assistants. Categorizing these kinds of expenditures as graduate assistantships for accounting purposes confuses the role of institutional support for graduate education and makes it difficult to track true expenditures for graduate education.

²⁴ It is not clear to us if the University is making adequate use of fixed-term instructors, but these should certainly be part of the picture. At minimum, fixed term instructorships can be used as a tenure-system faculty recruiting tool. More than one program indicated that it had lost candidates because the University could not accommodate their spouses in any way. In any case, we think this should be part of the discussion for strategically reallocating graduate assistantships.

²⁵ We published a paper by Suzanne Ortega, former Vice Provost for Graduate and Advanced Studies at the University of Missouri Columbia and now Dean of the Graduate School at the University of Washington, on this issue in our now-defunct periodical, *The Journal for Higher Education Strategists*, and have included a copy of it as Appendix E of this document.

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As we believe the new senior administrative team understands, we think program development is also crucial if the University is to increase its stature as a research institution. What needs to be accomplished principally is the building of second and third areas of research prowess in order to attract additional external funding and to back up the existing strength in health sciences. However, we believe that this new development should take place in an economic context different from past development. We think that in the new context, the University should assume that programming will be supported first by external grants (primarily from NIH) and second by tuition income from professional master's programs, including distance-delivered professional master's programs, and finally (and of significantly less priority), state allocations.

As we have already indicated, we think that the future for ECU lies in developing concentrated research excellence in areas that have immediate regional impact. The final section of this document—on new program development—will discuss in detail how potential ECU programs could relate to existing economic clusters in eastern North Carolina, but as we foresaw, there is not currently a critical mass of any particular kind of employer in the region, and consequently, we think it needs to be ECU's role to *initiate* economic development rather than simply to respond to initiatives already taking place in the region. This will be a significant change for the University: past program development was driven by some combination of faculty strength, interest, and readiness; future program development needs to be driven by regional economic development. For this reason, we think it would be helpful for the University to hire an economic development officer, reporting to the Vice Chancellor for Research, whose principal functions are to be in constant contact with the existing regional industrial base, to suggest avenues for program development based upon regional contact, and, working with interested parties in the region, to assess and build the feasibility of new economic development.

For this reason, we also think that technology transfer will be especially important for ECU, though we think the University needs to adopt a model of technology transfer that goes beyond faculty and student discovery and incubates basic services businesses that are essential to quality of life in the region.²⁶ Why couldn't business faculty and students, for example, begin start-ups that increase employment and services in logistics and manufacturing? In turn, that kind of technology transfer could also be integrated into programming, so that students might earn academic credit for the businesses they incubate. Our sense is that the fundamental task of the Division of Research and Graduate Studies is the alignment of research, programming, and technology transfer.

Ph.D. program development—when it happens²⁷—should take place in an additional context. Obviously, the primary purpose of Ph.D. programs is to prepare future faculty and, as such, post-degree placement should be on a national basis; but we also think it important that the University develop some mechanism for keeping some students in the region in order to build the intellectual and cultural capital that is the necessary foundation for a thriving service economy. This could be, perhaps, a partnership with AmeriCorps or some other organization

²⁶ We understand that the University has experienced some success in the area of medical technology transfer, though it is not clear if that success has been integrated into doctoral programming.

²⁷ We think the University's priority should be the development of professional master's programs.

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that helps finance a student's education in return for a period of community service in the region, which might then become a loyalty to the region.²⁸

A third context for doctoral program development should be an attempt to bridge some of the gap between ECU's current assets and those of other institutions that have successfully made the transition to a major research university. We have already indicated one of those gaps, but it bears repeating: there needs to be a cadre of professional master's programs for which students pay tuition. The second gap is a lack of doctoral programming in the arts and sciences, which appears to be crucial in providing the intellectual foundation for a research university. We are not advocating comprehensive programming in the arts and sciences, but as a beginning, Technical and Professional Discourse could be transformed into English, and Biomedical Physics could be transformed into Physics. The Dean of the Harriot College indicates that there is some readiness in other areas; and so long as these could also be justified as contributing the quality of life in the region, we think the University should explore these.²⁹

Apart from several programs in arts and sciences, we think that, in light of the economic cluster analysis given below and the University's own emerging research strengths, Ph.D. development should be confined to contemporary biomedical sciences—versus broader health sciences and with emphasis on the molecular biosciences—and, where feasible, to state-defined emerging and potential economic clusters, especially pharmaceuticals. Professional master's and doctoral programs³⁰ should focus on teacher training and renewal of the public schools and on state-defined existing economic clusters, all of which are related to manufacturing. There is another industrial category which we think will be of strategic importance to ECU, but we will take this up below in our discussion of economic clusters.

Finally, we think that graduate program development at ECU will need to take account of distance delivery. Apart from a handful of programs in Education and a few other areas, online and off-site education at ECU are imbedded in otherwise traditionally delivered programs. We think it will be important to develop a cadre of online professional master's programs that can be marketed nationally and used as a source of tuition revenues.³¹ Distance delivery, in our view, is not an overarching remedy, however, since the model of distance education which ECU has adopted and which makes ECU's distance education distinctive—the provision of online student support services—makes distance delivery more expensive than it otherwise might be. It is possible that some of the cost associated with

²⁸ It is also possible that at least some Ph.D. programs could be developed as joint programs with other institutions in the state, since this would defray at least some of the cost of maintaining the program. It could be, for example, that ECU would provide some instruction and a practical internship—consisting of regional service—as part of a Ph.D. program, additional parts of which could be offered elsewhere in the state.

²⁹ We did look at the development of doctoral programs at both UNC Greensboro and North Carolina A&T. UNC Greensboro probably is the right model for ECU, since it has programming in the basic arts and sciences, as well as more “applied” degrees. We think it important that ECU regard NC A&T as a partner institution with which to develop joint programs.

³⁰ By professional doctorates, we mean doctoral programs without the nomenclature “Ph.D.,” such as the Ed.D. and the DTS.

³¹ We heard repeatedly from faculty that people living in the region had to be supported through assistantships because they are too poor to afford tuition. While we don't believe this to be entirely true, national marketing would certainly produce a pool of qualified and paying students.

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distance learning could be defrayed. We think the University should experiment with hiring a class of faculty whose teaching duties are entirely by distance. At least some of these could be fixed-term instructors.

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Doctoral Program Assessments

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School of Allied Health Sciences

Communication Sciences and Disorders

The doctoral program in Communication Sciences and Disorders appears to be well thought through in terms of curriculum, though we don't understand the imposition on students in a Ph.D. program of a choice between research and clinical tracks, and is evidently well-taught. Faculty in the program seem very ambitious for both themselves and the program, and give serious consideration to both student publications and professional development activities.

The faculty's sense of itself, however, appears to be based on data that are very different from the official institutional data we have, which is mixed in terms of program performance indicators.³² There is no faulting the program in terms of size, since it has by far one of the smallest faculties in the comparative cohort for this study. With eight faculty, it is well below the mean cohort faculty size of 15.2 and trails behind every program except for the one at the University of North Dakota. Despite this, its doctoral enrollment of 17.7 students is significantly above the mean enrollment for the comparative group and, in fact, is larger than that of all but three of the comparator programs. As a result, its doctoral-student-to-faculty ratio of 2.21 students per faculty is the highest in the cohort and substantially above the mean ratio of 0.9 students per faculty.

We are not certain, however, that the quality of current doctoral students is as good as it should be, since the three-year average combined GRE score is below the mean for the comparative group—is, in fact, the lowest, in the cohort. The problem is with the GRE verbal score, which is nearly 50 points lower than the other verbal scores in the cohort. The program's average quantitative score is well above the others.

We are less certain of the program's productivity in degree production, since though the official IPR figure for degrees conferred over the period of the study is eight, though faculty reported during our assessment interview that they had granted 11 degrees. Protocol dictates that we accept the IPR figure, in which the program—as a function of small faculty size—is slightly below the cohort mean of 9.9 degrees. On a per-faculty basis, however, and even using the IPR figure, faculty are highly productive, producing one degree per faculty versus the cohort mean of 0.6 degrees per faculty.

In terms of performance indicators related to research, unfortunately, there is no ambiguity. As a program, Communication Sciences and Disorders at ECU is more than \$200,000 below the mean for the cohort for average annual research income, and this pattern holds true on a per-faculty basis. On average, cohort faculty each earn approximately \$34,000 per year in external grants; ECU faculty, on average, earn \$28,000 per year. The publication record is similarly undistinguished. As an overall basis, the ECU faculty published approximately 900 fewer papers than the mean number for the comparative group, though such a large discrepancy is a function of faculty size. Individual faculty are closer to the group mean, publishing 69.9 papers versus 79.7 papers for the average faculty member in the cohort. The citation record is more definitive: individual ECU faculty received, on average, 262 citations

³² This is illustrative of the infrastructural issues we discussed above in the general section of this document. Part of establishing a research culture in which performance indicators are tracked is developing common definitions of various data elements in order to be certain that both administrators and faculty are on the same page in the discussion of indicators. We think that the Office of Institutional Planning and Research should take the lead in developing these common definitions.

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during the five-year period of the study, while the average faculty member in the cohort received 534 citations.

The program's competitive indicators are mixed. Because the program in the health sciences, its health insurance benefits for students are fully competitive with the comparative group. We are concerned, however, that students do not routinely receive full remission of tuition; and the doctoral stipend, at \$12,000, is significantly below the cohort mean. In our view, the stipend should be \$15,000. It is not clear to us if program faculty include support for doctoral students in their grant proposals, but it is certain that some of its benchmark programs do.³³ This is part of the solution here, though in the interim, we think the program could afford to accept fewer doctoral students in order to increase the amount of the stipend. The average time to the doctorate of 5.4 years is fully competitive for the group and slightly shorter than the group mean of 5.5 years.

Physical Therapy

The doctoral program in Physical Therapy is new—too new to have yet produced any Ph.D.s—and, as a result, is difficult to assess. Perhaps as a result of the youth of the program, faculty research efforts are also new, and the program exhibits the chicken-and-egg syndrome that we discussed above in the general section of this document. During our assessment interview, program faculty expressed their strong conviction that in order to jump-start faculty research programs, they will need the support of either the Graduate School or the University Vice Chancellor for Research in providing funding for graduate research assistantships.

As we indicated above, it is possible that some internal funding will be inevitable, though in our experience, it is rare that graduate schools provide research assistantships to programs. If faculty hiring is on the docket for this program, we suggest that hires be at the senior level in order to attract faculty who can both transfer external grants to the University and provide faculty leadership in developing research proposals.

Unfortunately, and also as a result of the youth of the program, performance indicators related to size, enrollment productivity, research prowess, and competitiveness are uniformly poor in relation to the other programs in the comparative cohort. In terms of program size, the faculty of eight professors is small relative to the cohort mean of 11 faculty per program. This is not, however, the smallest program in the group. It is roughly the same size as the ones at Old Dominion and the University of South Carolina, and it is slightly larger than the program at the University of North Dakota.

Given small faculty size, its enrollment of 32 doctoral students is less than half the mean enrollment for the cohort—80.6 students. Likewise, the doctoral-student-to-faculty ratio is also half the size of the group mean—4.0 students per faculty in the ECU program versus the mean ratio of 8.1 students per faculty. Its ratio is, however, roughly equal to those at Buffalo and South Carolina—both established programs—and is better than that of Ohio University, another new program. It is highly possible that ECU doctoral enrollment is, at this point, limited by the number of students it can place in clinical practica, since program faculty complained—rightly—about the cumbersomeness of the bureaucratic procedures regulating the signing of contracts for clinical sites. We have already discussed this issue above in the

³³ We have recently finished a doctoral program assessment for the University of South Carolina and have, in the past, benchmarked against the University of Pittsburgh. Including tuition and stipend support on grant proposals is routine in these institutions.

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general section of this document, and recommended that the University order an audit of some of its administrative procedures, especially those related to the signing of contracts. The program has set a target enrollment of 60 students, which would place it well above enrollment productivity in the cohort.

At this point, it appears that the program is attracting and admitting students of an appropriate level of quality. The three-year average GRE verbal score is precisely equal to the mean verbal score for the cohort, and the average quantitative score of 621 is well above the cohort mean of 562. We think it would behoove the program to also require that students submit analytical writing scores for admission, since the consensus in the field is that this is as good an indicator as any of potential student success.

As we have already stated, research performance indicators are very unfavorable, and suggest that this is the program's most serious competitive weakness. Average annual research earnings for physical therapy programs in the cohort are approximately \$171,000; the ECU program's earnings are approximately \$13,000. On a per-faculty basis, average research earnings for the cohort are roughly \$16,000; ECU's faculty earn, on average, \$1700. The individual faculty publication record is better, though not good: ECU faculty published 50 papers from AY 2000-01 through AY 2004-05; the average faculty member in the comparative group published 57 papers. On average, individual faculty in the cohort received 396 citations; ECU faculty received 253.

Competitive indicators are also weak. Program faculty report that the Dean of the College is funding health insurance for those students in the program. IPR indicates otherwise. Since this is a professional—rather than a research—doctorate, we are hard pressed to understand why faculty and students have the expectation of assistantship funding at all, but every program in the cohort does provide some funding—at least to some students. That said, the ECU program provides the lowest stipend in the comparative group. It is currently \$7500, but to be really competitive in this cohort, it should probably be about \$10,500. Our understanding is that assistantship funding is provided primarily through the Dean of the College, who is using lapsed salary funds, but we think this money would be better spent in hiring senior research-active faculty.

Rehabilitation Counseling and Administration

The doctoral program in Rehabilitation Counseling and Administration is also too new to have yet produced any doctoral recipients or to have developed a nationally competitive faculty research program. As such, it is difficult to assess, though we have seen some oddities in the initial program development that we think it would be best to correct at the start.

Program leadership is very ambitious and would like to develop the program to the point that it can compete effectively with the one at the University of Wisconsin-Madison. At the moment, the practical face of this ambition is the program's desire to train, in about equal measure, both clinical administrators and future faculty.

Though we admire and want to encourage this degree of ambition, we think, given the performance indicators we will discuss in detail below, that it is premature and places an undue strain on the program to operate both professional and academic tracks at this point. We believe the program would be best served at the start to focus on producing clinical administrators and to delay the preparation of future faculty until it has had an opportunity to develop its own research profile.

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In turning to performance indicators, we begin by noting that this is a very small program, with an FTE faculty count (eight) that is less than half the size of the mean number of faculty for the comparative cohort (18). As a result of this and of relative youth, the program is dramatically under-enrolled in terms of the comparative group, with a doctoral enrollment of six students (0.75 students per faculty) versus a mean enrollment of 37.2 (or two students per faculty) for the cohort.

The program's students appear to be of a high caliber, however. Three-year average GRE scores in both the verbal and quantitative sections of the test are above the means for the cohort—on the verbal test, ECU averages 515 versus the cohort mean of 505; and on the quantitative test, ECU averages 560 versus the cohort mean of 520. Assuming normal attention to mentoring and the monitoring of student progress, these scores bode well for good degree production and time to degree—assuming that the small faculty can keep up with the demands that doctoral students will place on its time.

The program's performance indicators for research are a serious issue. Given the size of the faculty, we would expect the program to fare poorly on overall average annual research income—and it does, earning approximately \$113,000 versus a mean for the cohort of \$1.9 million. The problem continues if we examine research earnings on a per-capita basis, however. On average, individual faculty in the cohort earn approximately \$152,000 per year; ECU faculty earn \$14,000 per year.

The faculty also under-performs in terms of publications. Because of anomalies in the ISI database, we are fairly certain that we have over-counted ECU publications over the five-year period for the study. Even at that, program faculty appear to have published 20 papers over the period of the study (four per year) against a cohort mean of 30 papers per faculty (5 per year.) Our deeper concern is that the director of the program is currently projecting publication standards for tenure (1.5 papers per year, on average) that are not adequate for a viable doctoral program. (We think that five to six papers per year are necessary.) Similarly, the director proposes a tenure standard of submitting two to three grant proposals per year, whereas we believe the standard should be that faculty will actually receive a minimum of \$100,000 in funding through the actual award of at least one grant during the period of assistant professorship.

Competitive indicators for the program are much better. Full tuition remission is both competitive and necessary, and the doctoral student stipend of \$15,000 significantly exceeds the mean stipend for the cohort of \$10,950. In fact, we think that, so long as the stipend is not provided out of faculty grants, the amount could safely be reduced and the remainder reallocated to other programs where lack of a competitive stipend is an issue.

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Thomas Harriot College of Arts and Sciences

Biomedical Physics

The doctoral program in Biomedical Physics is particularly difficult to assess for several reasons. The first is that the specialized choice of biomedical physics—rather than Physics—for the doctoral program makes it necessary for us to compare the ECU program with far more established programs at some of the country’s foremost universities: Purdue, UCLA, Minnesota, and Wisconsin. Having such institutions in the comparative cohort makes it especially difficult to scale the standard in a way that is fair to the ECU program, a relative newcomer to the field.

The second difficulty is that program faculty, particularly department chair John Sutherland, ignored the project instructions given by the administration, attended the assessment interview in a group much larger than was requested, and side-stepped the interviewer’s protocol by insisting on presenting a Power-Point presentation in order to convey a very particular image of themselves. Unfortunately, the subject of that presentation was largely not the doctoral program in Biomedical Physics, but the department of Physics itself. That presentation of the department has obscured this assessment and indicates to us that program faculty are more concerned to build the department itself than to strengthen the doctoral program.³⁴

For a faculty of its size, the research interests of the department appear scattered. The program provided a schematic of faculty research interests that confirms this impression, indicating no more than a few faculty working in any single area. Faculty are, however, approaching critical mass in two areas: ionizing radiation and theory and computation in biological and medical physics. This schematic, in our view, evidences that the department faculty is not optimally configured to pursue a competitive research agenda, for precisely the reason discussed above in the general section of this document. Faculty hires, over time, have been designed primarily with a view to covering undergraduate instruction, representing as many subfields of the discipline as possible, with the result that critical mass for research strength is unachieved in any single area.

From our point of view, the category “biological and medical physics” is too broad to be useful in determining a hiring strategy, but the predominance of the category in the faculty schematic indicates that the program’s approach to its discipline is state-of-the-art and moving in the right direction. As program faculty retire and the department embarks on hiring, we think it should give specific emphasis to structural biophysics or to those areas of physics that interact with molecular and structural biology. This can be accomplished in part by departmental hiring, but we think it is crucial that the hiring plan of this department be well aligned with the hiring plans of Biology and Chemistry and with several departments in the Brody School of Medicine. The program’s choice as an aspirational peer of the Structural and Computational Biophysics at Wake Forest University is further evidence that the program is developing in line with the development of its discipline.³⁵ The problem is not with the program’s direction, but with lack of critical mass in specific areas.

³⁴ This is an illustration of the general tendency we have discussed above in the general section of this document (see page 11) for faculty to focus on the building of departments as resource channels.

³⁵ The choice as a peer of the Physics department at Northeastern University is puzzling to us, however. This is a department we know well for several reasons, and in our opinion, its departmental structure of faculty divided into theoretical and experimental high energy [continued on next page]

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The report the department provided of funded grants and contracts from 2000 through 2006 speaks directly to the problem of research fragmentation we have been discussing. It appears that, apart from the work of Professors Tolburen, Sutherland, and Lu, the grants the department is getting are very small and distributed to single investigators; and it is very difficult to develop a competitive research profile at these levels of funding. It appears, however, that this pattern may be changing. A group of five co-investigators received a large grant in 2004, with a member of the Chemistry department serving as principal investigator. We hope that this pattern will persist.

The program's placement profile is mixed, though with recent placements at Vanderbilt and the University of Michigan, we are encouraged. We expect that this profile can only improve as the faculty builds its research profile.

To turn to specific performance indicators, we begin with an observation we have been implying throughout this discussion. In terms of size, the faculty is small—at 20 faculty, it is considerably below the mean cohort faculty size of 26.6—though the department at Virginia Commonwealth is roughly the same size and the one at Purdue is significantly smaller. Overall doctoral enrollment is also small, reflecting faculty size, but the doctoral-student-to-faculty ratio of 0.9 students per faculty is precisely at the cohort mean. Program faculty at Wisconsin are handling roughly two students per faculty, and we think this would be an achievable enrollment goal for the ECU program to set.

The quality of doctoral students appears to be reasonably good, though thanks to a three-year average GRE verbal score, the combined average score for the program is one of the lowest in the cohort. (The average quantitative score is the highest in the cohort.) We think that the program is mature enough to command better quality students and recommend that it establish a minimum GRE combined score of 1250 for admission. Requiring the analytical writing score may also offset the effect of low verbal scores. Doctoral production is significantly below average on both program and per-faculty bases, but we assume this is a function of the relative youth of the program.

Research performance indicators are the program's weak spot, though this is also reflective of the unusually prestigious comparator programs that the choice of biomedical physics necessitated. Average annual research earnings for the cohort are \$5.2 million (or \$178,000 per faculty); research earnings for the ECU program are \$537,000 per year (or \$27,000 per faculty). The publication record continues this trend, with ECU faculty each publishing only 16% of the mean number of papers for the cohort. On average, ECU faculty receive only 11% of the citations of the mean per-faculty citations for the comparative group. These figures unquestionably reflect the fragmented research profile we have discussed.

Program competitive indicators are excellent. Full tuition remission and a stipend of \$21,500 are fully competitive for the cohort, as is the provision of full health insurance. The program's time to the doctorate is quite good, shorter than the average time to degree for the cohort by slightly more than half a year.

Coastal Resources Management

Because the University requires the development of second and third areas of research strength in addition to its traditional strength in basic biomedical sciences, the doctoral

physics and condensed matter is highly dated. At the time we examined the program, it was resisting the efforts of University administrators to develop a biological focus.

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program in Coastal Resources Management has been potentially targeted for growth and increased investment by the University's Vice Chancellor for Research. We have had some misgivings about this choice from the beginning of the project, in part because the field is one of the most competitive in terms of attracting external funding and in part because there are already several excellent programs in the region in precisely this area, at least as it is typically defined. During the course of this study, both performance indicators and unproductive behavior by program faculty have emerged to increase these concerns; and we think that these issues need to be addressed seriously before any further investments are committed.

We begin by addressing the apparent scope of the program. Though the program director points to a good balance between policy and science in the program, our analysis of the curriculum indicates that the emphasis on science is not nearly strong enough; and within what representation there is of science, the balanced is skewed heavily in favor of marine scientists, though we believe that to be competitive, the program will also need develop a focus in climate sciences. Much of the program's current focus is on nautical archeology, which though interesting and valuable for its own sake, is an academic novelty that—without a significant added emphasis on coastal sciences—is incapable of attracting the kind of external research profile that the VCR is interested in developing.³⁶

We are also concerned that the program appears primarily interested in training policy practitioners and draws a significant part of its student audience from adults who are undergoing career transitions. In our opinion, this does not bode well for creating a competitive research doctorate, and we think that the program needs to be equally concerned with training scientists who are educated about public policy.

The program's performance indicators reflect the lack of balance between science and social science and the program's student base of career transitioners. They also reflect considerable fragmentation of faculty research interests, institutionalized by the way faculty are organized, and as the program director indicated to us in our assessment interview, the fact that although the program has on the books many contributing faculty, relatively few faculty actually contribute to the program, since their primary allegiances are to the departments in which they are housed.

In terms of program size, the number of 7.5 FTE faculty participating in the program is very small in relation to the comparative cohort mean of 31.4 FTE. From the point of view of several of the comparator programs, the faculty is, in fact, dramatically under-sized: Delaware's Marine Studies program has a faculty of 56; the University of Rhode Island's program in Oceanography and Marine Affairs has a faculty of 48. Despite small faculty size, the program's enrollment is quite high—32.3 doctoral students (4.34 per faculty) versus a mean of 44 for the cohort (1.7 per faculty)—but in this particular case, we do not regard high enrollment as a positive indicator. To begin with, the quality of doctoral students is poor relative to the cohort. The three-year average combined GRE score for the program is the

³⁶ To complicate matters, those contributing faculty from the History department have shown a great reluctance to participate in the program, preferring instead to have a program of their own. We can understand this desire, though we specifically do not advocate the development of a history doctoral program based so narrowly on nautical archeology, because the yoking together of the various segments of the faculty seems to have been painted with too broad a brush. So far as we can tell, coastal science and policy and nautical archeology have in common only that they both have to do with the sea; and this is not nearly enough commonality to create a coherent research mission.

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lowest in the comparative group—1047 for the ECU program versus a mean of 1160 for the cohort.³⁷ The more important issue, however, is that doctoral production is exceptionally low—the lowest in the cohort, in fact—with only three students completing their degrees during the five-year period of this study.

Per-faculty degree completions for the program (0.3) are also below the cohort mean of 0.6 degrees per faculty; and we wonder if the issue is that the energies are too scattered to handle as many students as they do, most of which have been languishing in the program for some time without completing their degrees. We also have the impression that low completion rates are caused by an undue emphasis on student achievement of curricular structural milestones and a lack of adequate mentoring when students reach the crucial stage of writing their dissertations. Unquestionably, the fact that many students are working adults also contributes to this problem.

In this particular field, those programs that grow to vibrancy basically function as research institutes, in the sense that most of their activities are funded out of soft money—significant amounts of soft money at that. In this program, the faculty are primarily focused on departmental demands, including the generation of student credit hours in their home departments, and this is not conducive to building a significant grant profile. Structural division also plays a role in this. As we were compiling data for this study, the director of the Center for Coastal and Marine Resources argued fairly strenuously that research dollars earned through the Center not be attributed to the doctoral program—even for analytical purposes. This is an illustration of the tendency we noted in the general section of this document: because of competition for resources, faculty are preoccupied with factors of separation, and this is not healthy for an interdisciplinary program that needs to function as a research institute in order to be competitive.

It is not simply that the FTE faculty count is very low, though this is a serious issue. The more important issue is that its research interests—especially for such a small faculty—are more scattered than those of any program in our experience. In mapping journal titles to ISI taxonomic fields, which is necessary to obtain publication and citation counts, we noted that the program FTE faculty of 7.5 are publishing in 19 separate disciplines—an enormously disproportionate number, even allowing for the fact that journal publications probably represent the work of faculty who are only minimally involved in the program.

As much as any of the other issues we have discussed, this research fragmentation probably accounts for the very poor research performance indicators for the program. Average annual research earnings for programs in the comparative cohort are roughly \$9 million (or \$261,000 per faculty); research earnings for ECU faculty are \$1 million per year (or \$146,000 per faculty)—the lowest performance in the cohort on a program basis and the second-lowest on a per-faculty basis.

The publication record, also low, appears confusing at first. As a program, ECU's Coastal Resources Management program published the fewest papers of any program over the five-year period we examined—644 versus the cohort mean of 1434. On a per-faculty basis, the ECU count appears above the mean, 86.4 papers versus 54.7; but we are certain that this is a false reading caused by the unusually high number of disciplines represented in the faculty's publishing history. Unquestionably, program faculty are receiving undue credit for

³⁷ As with many other programs, the problem with below-average GRE scores is low scores on the verbal section of the test, particularly problematic in this program since it has a focus on the social sciences.

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publications that have nothing to do with coastal science and policy but that were written by faculty in participating departments. We think the same phenomenon is at work for the apparently high number of citations received—355 citations versus a mean of 216.5 citations for the cohort.

Competitive indicators are mixed. Some students in the program (presumably the working adults) receive no tuition remission at all, while we think the standard for the cohort is full tuition remission. The stipend of \$18,000 is quite good—the second-highest in the comparative group and considerably above the mean doctoral stipend of \$16,747. Lack of student health insurance, as with other ECU programs that are outside the health sciences, is obviously a competitive issue.

We cannot say definitively if research space is an issue for the program or not. Since NSF does not collect or release space data for this type of program, we are unable to derive square footage for the other programs in the cohort. Two of the cohort programs, however—the ones at the University of Massachusetts at Dartmouth and the University of South Carolina—have been our clients during the past year. Research space for the ECU program is smaller than the space allotted to these two comparator programs.

During our assessment interview, the director of the program indicated that he felt the program was ripe for a retreat to determine its future direction. We concur with this belief. Beyond this, we think that because of the separationist tendencies of ECU faculty when it comes to the sharing of resources, it is in the best interests of this program to have a core of faculty whose primary appointment is to the program.

Health Psychology

The new doctoral program in Health Psychology illustrates the phenomenon we discussed above in the general section of this document, in which the University launched new doctoral programs without a real understanding of the barriers to entry for the fields—to the extent that those barriers continue to exist even after the program was approved by the state. As a result of this situation, the director of the program was considering, at the time of our visit, delaying the admission of the first cohort of students until the 2007-08 academic year, which would give the program time to build itself to the appropriate level of qualification before commencing operations. This was to include the hiring of five faculty who are qualified to direct the dissertations of students in the field. We are unaware if this delay was actually implemented, but the situation has caused us to treat the program in Health Psychology as a proposed program rather than an existing one.

Lack of qualified faculty to direct dissertations is not the only challenge the program needs to overcome. There is currently no budget to support doctoral students, nor are the final details of the program's clinical site network ironed out with either the Medical School or the clinical sites themselves. At the moment, there is also no curriculum focused on health psychology but a clinical psychology curriculum that offers a few courses in health-related topics.

In any event, in order to launch successfully, the program will require start-up money for new faculty, seed money to initiate the research programs of the existing faculty, and a faculty professional development program in writing grant proposals. In order to offset these costs, and assuming that faculty searches are still ongoing, we recommend that the department confine itself—to the extent possible—to hiring only senior faculty who can transfer external grants with them to ECU.

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Despite these considerable obstacles in launching the program, our feeling is that a doctoral degree in this area fits in very well with ECU's overall emphasis on rural health and medicine, the University's overarching foci on obesity and diabetes, and the institution's regional service mission. The program director seems competent and well aware of what he needs to do to build a quality program.

Prior to deciding to treat Health Psychology as a proposed rather than an existing program, we did collect performance indicator data from a number of institutions in the comparative cohort.³⁸ This data now serves as a set of standards which the new program will need to emulate, though this is not an unproblematic task. Health Psychology itself is an important, though new, academic discipline; consequently, there are only a handful of such doctoral programs in the country—and, unfortunately for ECU, they are housed at some of the nation's most prestigious and wealthy institutions: Duke; Rutgers; UCSD and San Diego State University, which together offer a joint program; Stony Brook, and Florida. The program director and appropriate administrators will need to decide how to scale appropriately expectations for the ECU program; though ultimately, the program will need to compete effectively with the field.

The mean faculty size in Health Psychology for the comparative cohort is 24.9. Ironically, ECU's current faculty is significantly larger at 32, but most of these are clinical psychologists who lack the appropriate degree of research activity in health psychology. Average doctoral enrollment in the cohort is 30 students or 1.5 doctoral students per faculty, and the average combined GRE score is 1237, including a significantly higher verbal score (617) than ECU programs are currently accustomed to getting.

By far, the greatest challenge will be for the program to increase its research prowess. Mean per-faculty average annual research earnings are \$835,000; current earnings for ECU faculty are \$2600 per year. The mean five-year publication figure on a program level is 1906 papers (or 136 papers per faculty); the current ECU figure is 504 (or 16 per faculty).

Competitive standards are also steep. The standard doctoral student financial support package includes full remission of tuition and fees, and a stipend of \$17,377, though several programs in the comparative group have stipends of \$20,000 or above, and we expect this will be the standard to meet.

Technical and Professional Discourse

We have some ambivalence about the form of the doctoral program in Technical and Professional Discourse. Though it appears to be well-formulated in terms of curriculum and we believe it to be state-of-the-art for its discipline—in fact, we think it is an early example of what Rhetoric and Composition programs will become over the next decade or so—we think, as we discussed above in the general section of this document, that the University is in greater need of broader doctoral programming in the arts and sciences to achieve the research stature that it desires.³⁹

On the positive side, we see evidence of research leadership among some of the faculty in the program and we endorse completely the program identity that is described on the program's

³⁸ These data are now presented in Appendix D: Comparative Program Data.

³⁹ We suppose that in some sense, the question is moot, however, since it was probably necessary for the sake of program approval not to submit a proposal for an ordinary doctoral program in English to the state.

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web site and in its promotional and other materials provided to us by faculty. We think the program's assumption that it will be training people for jobs both inside and outside academia is naïve, however; and, in our opinion, it would be best if the program accepts the fact that, with rare exception, it will be training the next generation of scholars and faculty in English and cultural studies.

In terms of size, the program boasts the single largest faculty in the comparative cohort—literally double the mean faculty size for the group. Given this, we are puzzled by the remarks of some of the program's early reviewers that the program's enrollment goals are too ambitious—especially since, on both a program and a per-faculty basis, the program is significantly under-enrolled. A faculty of roughly the same size at Texas Tech has a doctoral enrollment of 32, while the ECU program enrolls merely 10 doctoral students. A program of about half the size at Michigan Tech enrolls 36 doctoral students, as do programs at the University of Minnesota and Ohio University, even though they have significantly smaller faculties. Perhaps current enrollment is a function of the program's youth, but we see no reason that, over time, the program shouldn't be enrolling two doctoral students per faculty member, which is about standard for the field.⁴⁰

The program is not yet old enough to have produced doctoral degrees. Since time to degree is a serious issue in this discipline, however, we recommend that the program take early steps to ensure reasonable time to degree, including the monitoring of timely curricular milestones, energetic and frequent mentoring of students writing dissertations, and especially, the elimination of a master's degree as a requirement for admission to the program, since this can only serve to lengthen time to the doctorate from the bachelor's degree.

Research performance indicators for the program are not favorable. English is not a field that typically attracts significant external funding, particularly of the kind that generates indirect cost allocations, but we have rarely encountered an English program that has no external funding. That said, external funding for this program is the fourth-lowest in the comparative group, ahead of only the program at Michigan Tech—a program which we know well and which has an insufficient faculty research orientation—and the programs at Clemson University and Virginia Commonwealth University, both of which are new.

Journal publishing is also less significant in English than it is in many other fields, but the ECU program published 75 fewer papers during the period of this study than the mean number of papers published for the group—astounding since it has the largest faculty in the cohort. The per-faculty publication record is more telling, however. On average, faculty members in the comparative cohort each published 15 papers over the period of the study. ECU faculty each published approximately four papers over the same period. We would have

⁴⁰ One of the reasons for under-enrollment at this point may be lack of appropriate financial support for students. In fact, a serious weakness of the program is that some of its students are required, for the sake of financial support, to work outside their field in some other department. We assume this issue is complicated by the fact that the department provides teaching assistantships to a large number of master's students in order to cover instruction in freshman composition; but all the evidence in the field suggests that it is both less expensive and more effective to have these courses covered by fixed term instructors—and we emphatically reject the notion that the use of such instructors compromises the quality of the undergraduate program. One effect of adopting this solution would be to increase the amount of assistantship funds available for Ph.D. students.

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liked to see the number of books published by faculty in each of the comparative programs in the cohort. Unfortunately, these data are not available.⁴¹

Competitive indicators for the program are also unfavorable. The doctoral stipend of \$14,000 is slightly below the mean stipend for the cohort, but not significantly so. From our point of view, the more serious issue is lack of full tuition remission for some students.

⁴¹ There is a new company in the market that compiles such data, but our experience in using their information for two other client institutions for which we have performed doctoral assessments is that it is not yet ready for sale—primarily because the company assumed that it could use web crawlers to collect program and faculty names. In our experience, the average graduate program web site is three years out of date. Though the company made an attempt to verify web data through graduate deans, it had only a 25% response rate to its inquiries.

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College of Education

Curriculum and Instruction

The Ph.D. program in Curriculum and Instruction is in the proposal stage, and as part of this project, we examined the supporting documentation that C&I faculty have thus far prepared. In our view, this documentation evidences the confusion between professional and academic, clinical and research that is common to many ECU doctoral programs.

Given the existence of other Curriculum and Instruction doctoral programs in the state, we do not believe that this program will be approved as it is currently conceived, for several reasons. It is a major question to us, given the current state of resources at the University, whether the ECU program can simultaneously address both the professional education needs of curriculum specialists and policy personnel in the region and state and the shortage of college faculty in special education, reading and literacy, and elementary education. If the ECU program were to address the shortage in higher education personnel, we think it could only do so at the expense of the College of Education's mission to regional schools.

The department further believes that it can attract an audience of both potential college professors and regional classroom teachers; but in the first place, the knowledge base, research skills, and curricular specializations of teachers at these levels are vastly different—different enough, at any rate, to be unsupportable by a single program with limited faculty. Besides, it is almost the universal experience of colleges of education that students who pursue doctoral degrees do so specifically because they intend not to remain in the classroom, and the doctorate is perceived as a stepping stone into school and district administration.

We think the program would be much better re-conceived as a professional doctorate (Ed.D.) aimed primarily at regional teachers and other school personnel whose ambition is to work in public policy or in district curriculum administration.

Educational Leadership

We are ambivalent about the doctoral program in Educational Leadership, primarily because it is very ambitious and designed to be rigorous, which we want to encourage; but its high degree of ambition has led it to over-reach itself significantly, and has produced a situation that program faculty describe as “near crisis,” in which a large number of students is reaching the dissertation phase of their work and there are not enough faculty to supervise adequately that number of dissertations.

We believe that this “near crisis” is the result of two fundamental flaws in the design of the program. The first is a common practice among the various fields of education, and that is the tendency, in the face of criticism from much of the rest of the academy about lack of rigor in educational programs, to introduce overly-stringent research requirements and research methodological courses, into what are essentially professional programs. According to the former Dean of the College of Education, the original intent of this program was to engage in problem-centered research rooted in regional schools for the purpose of training district superintendents. Program faculty have instead sought to integrate research requirements into every part of the program and, at the time of our visit, were considering the development of four-course sequence in research methodology. We do not support these efforts, and we wonder why the current requirement of a dissertation cannot be replaced with a capstone research project based on field research in the schools.

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The second design flaw is the program's introduction of a specialization track in higher education, the audience for which appears to be educators whose career ambition is to join the Education faculty at ECU. Faculty reported to us that University of North Carolina President Erskine Bowles expressed the belief that this track is "expendable." We concur with this assessment, in part because there is no shortage of such program offerings in the state and in part because it dilutes significantly the program's mission focus on regional schools. If this track is to continue, we recommend that its stated purpose be specifically the preparation of state and regional community college leaders and not university faculty. This change should have the effect of realigning the program's enrollment and kind of students with its original mission.⁴²

None of this is to say that the program's faculty is not highly productive. In fact, the program's performance indicators evidence that it is over-productive in many areas, and as we have already stated, this has created the "near crisis" condition in which too few relatively research-inactive faculty are supervising too many research-oriented dissertations.

To turn to performance indicators, we note that, on paper at least, the faculty of 14, approximately half of which are fixed-term instructors rather than tenure system faculty, is not small. It is slightly above the comparative cohort mean of 13.1 faculty and significantly larger than the faculties at Old Dominion, Nevada Reno, and Virginia Commonwealth. However, the program is, as faculty indicated, dramatically over-enrolled, with 130 doctoral students (or 9.3 students per faculty)—the largest enrollment in the cohort with the exception of the program at Virginia Commonwealth which, with a faculty of 9.5, enrolls 133 students (or 14 students per faculty). Mean enrollment for the comparative group is 71.6 (or 5.3 per faculty), and given this, we wonder of what quality student research can be when faculty supervisors are so overburdened. It is not clear to us from this analysis how many of these students pay their own tuition or have it covered by their districts; and so we are unsure of the financial implications for the institution if the program were to introduce planned enrollment decreases. In any case, if these students are supported from state funds, enrollment should certainly decrease—and as soon as possible. If not, then this enrollment decrease will need to be taken into account in the University's long-range comprehensive enrollment management plan, discussed above (on pp. 130-14).

Relative to the rest of the cohort, the program's students appear to be quite good, with higher three-year average GRE scores than any other program in the group. Whether higher scores are relevant to school practitioners or the higher education track, it is impossible to say; but if they are appropriate to the higher ed track, we feel the program has some room to allow scores to drop as part of the change in its enrollment profile.

Not surprisingly, and apart from Virginia Commonwealth and the University of South Carolina, both of which are larger programs, the ECU program has the highest degree production record in the cohort, both overall (45 degrees versus the cohort mean of 31.4) and per-faculty (3.2 versus the mean of 2.3). The questions are how long faculty can hold up under this burden and the research quality of students' dissertations.

The program's adopted over-emphasis on traditional research would not be so troublesome to us were it not for the program's relatively poor performance on faculty research and

⁴² We also think that there is a particular danger in any program hiring a disproportionate number of its faculty from among its own alumni. This is especially true for East Carolina, where the insular nature of the community has helped to create many of the issues we have addressed above in the general section of this document.

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scholarship indicators. In virtually every category, ECU indicators are well below the mean indicators for the comparative group. Mean average annual research awards for the cohort are \$178,579; ECU's average research earnings—despite having the third-largest faculty in the cohort—are \$102,649. Average per-faculty earnings for the cohort are \$11,717 per year; ECU faculty earn \$7,332 per year. While the mean number of papers published for the cohort are 24 over a five-year period, the ECU program published 14 papers; and on a per-faculty basis, ECU faculty published one paper against a cohort mean of 1.8 papers per faculty. During the same five-year period, ECU received 11 citations (one per faculty) against a cohort mean of 19.8 citations (or 1.5 citations per faculty). Clearly, this is not a research profile that can support the completion of numerous research-oriented dissertations.

We do not believe, by and large, that students in professional doctoral programs should be supported on assistantships, though some are in every program in the comparative group. In that context, we note that the ECU program's doctoral stipend of \$10,000 is almost competitive with the field. The cohort mean stipend is \$10,638. Several programs in the cohort (Louisville, Nevada Reno, and Virginia Commonwealth) offer full tuition remissions. The ECU program does not, though given our bias about student support in professional doctorates, we do not see this as an issue. Average program time to degree is too long by slightly more than half a year, though this is not surprising given the context of over-enrollment and over-production.

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College of Health and Human Performance

Bioenergetics

Of all the programs we are evaluating at East Carolina, the doctoral program in Bioenergetics is one of two that are the most difficult to assess, in part because it is a pioneer in its field. In the entire country, we were able to find only one other program that is an exact cognate for this one—the program in Human Bioenergetics at Ball State University—and two others that match fairly closely—the program in Movement Sciences at Florida State and the new program in Human Movement Sciences at Old Dominion.

The remainder of the programs in the comparative cohort are as close as we can come to the scope and content of the ECU program, but they run the gamut from traditional Exercise Science to Exercise Physiology tracks within larger biological and biomedical sciences programs.⁴³ In this latter case, it was impossible to collect comparative data at the level of the track, since universities rarely track data at a level below departments, let alone for tracks within programs.⁴⁴ Nevertheless, despite a significant concern we have for both the scope and the name of the program, we believe the program is doing quite well and could be improved if it were to exist within a wider academic context.

To touch first upon our concern, we return to the discussion we began above in the general section of this document. The program in Bioenergetics is an illustration of what we have called elsewhere development by synecdoche,⁴⁵ that is, development of a narrow sub-field as an entire program, perhaps in an attempt to avoid the charge of program duplication that frequently arises in the state approval process for new programs. In our experience, programs of this type frequently have trouble finding an audience, in part because students searching for programs by their common name frequently miss programs with unique or unusual names, and in part because students who do find the program fear that their career options will be limited because of the overspecialization that the subfield represents.

In the case of this particular program, faculty reported that they were unable to meet their minimum expectations for enrollment. It is far too early to tell—especially in the absence of a rigorous professional marketing campaign—but we think it may be inevitable for this program to change both its scope and its name in order to meet the state of North Carolina's minimum requirements for program viability.⁴⁶ In the meantime, the program appears to be doing many of the right things, including seeking research collaborations with the Medical School's program in Biochemistry and Molecular Biology, a collaboration that, in our opinion, will have a significant positive impact on the program's research profile.⁴⁷

⁴³ We avoided programs in Kinesiology or other exercise programs that are frequently housed within colleges of education.

⁴⁴ The same issue exists with a Texas A&M survey provided to us by the program director, in which the program fares well; but this survey is based upon the excising of exercise science from a larger scientific context. As we will discuss in greater detail below, it is not clear to us that bioenergetics at ECU is well-served outside the context of basic biomedical education.

⁴⁵ See page 8 above.

⁴⁶ There is also an alternative solution. Though we do not believe that the individual basic sciences programs in the Brody School of Medicine are ready to be merged into an integrated biomedical sciences program, we believe that this ultimately will be their course. Should that happen, the program in bioenergetics could become a track of that integrated program.

⁴⁷ Unfortunately, space plans for the new facilities at the Brody School appear to be far advanced. If possible, we would prefer that this program be located there, especially since [continued on next page]

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Apart from enrollment, which could be a reflection of program youth or of the phenomenon we described above, program performance indicators show that the program is both well-conceived and well-managed, and the program appears active in benchmarking itself against similar programs in the field. In terms of size, the program is small, but not unduly so. Its faculty of 10 is below the mean cohort faculty size of 12.1, but there are several programs in the comparative cohort that are significantly smaller, including the precise cognate at Ball State. As we have already indicated, the program is under-enrolled. Its 11.7 doctoral students (1.17 students per faculty) is below the mean cohort enrollment of 21 (1.8 students per faculty). In the short term, we think the program should aim to enroll at least two doctoral students per faculty.

Despite the relative youth of the program, it is currently enrolling the highest quality students in the comparative cohort, with three-year average GRE scores that are higher than those of any other program. (This is also one of the rare ECU programs the students of which have above-average verbal scores.) Degree production is extremely low at this point, but we assume this is a function of program newness and would look to have at least two doctorates produced per year from this point forward. Obviously, this should increase as enrollment increases.

This program is another rarity for ECU: it is the only one of the University's doctoral programs for which research performance indicators are uniformly excellent. The mean average annual research earnings of approximately \$7 million for this program are literally the highest in the cohort, and significantly above mean research awards of \$1.9 million. On average, ECU bioenergetics faculty earn \$705,000 per year in grant income—versus \$220,000 for the average faculty member in the cohort.

During the five-year period of this study, program faculty published 658 papers (66 per faculty—versus a comparative group mean of 553 papers (42 per faculty). The program's overall and per-faculty citation records are bested only by those at the University of South Carolina's program in Exercise Science, and are well above the means in both categories. Our only complaint related to research performance indicators is, as we mentioned in note 47 above, that the program's amount of research space is inadequate—2,114 net assignable square footage versus a cohort mean of 16,336 NSF. The mean figure is artificially driven up by the enormous amount of space enjoyed by the program at Ohio, but even if we remove this outlier from the data set, the ECU program is still significantly below average in terms of space.

Competitive indicators are also excellent, though we are concerned that some students do not receive full tuition remission. The doctoral stipend of \$21,500 is the second highest stipend in the cohort and well above the mean of \$16,500; students receive full subsidization of health insurance; and the time to degree of four years is substantially shorter than the cohort mean of 5.3 years.

In all, we believe this to be an excellent doctoral program, though as we have indicated, time may well dictate that the program, in order to find a wider audience, will need to broaden its scope and change its name. Given this possibility, we think it is important that the University invest some money in promoting the program and that both the program and administrators agree on minimum enrollments over time and track results.

our analysis confirms the faculty opinion that the program's current location is inadequate in terms of research space.

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Health Intervention Science

The doctoral program in Health Intervention Science is, at this point, a proposal, and had only begun to be developed at the time of our visit to campus. Both the assessment interview with potential program faculty and the supporting documentation were, therefore, necessarily vague.

We observe first the whole area of preventive health care is exceptionally important for the University, and it is clear that the program, if it goes forward, could draw on both the cross-departmental research strength in metabolic science and the research prowess of faculty in the bioenergetics program. Beyond this, program planners assume that they could draw on the existing research base in Physical Therapy which, in our view, has yet to be developed, and on the one in Occupational Therapy. Of that particular program we have no direct knowledge, since it did not participate in this study, but the Dean of the School of Allied Health Sciences indicated clearly in his interview with us that OT is an area that is languishing. Consequently, it is doubtful, in our opinion, that faculty research in the relevant areas is strong enough to support a doctoral program in this area.

It is also not clear to us what this program would be trying to produce—academicians and researchers or therapists. If academicians, we refer to our argument of the previous paragraph. If therapists, we are not aware that the field in general would be willing to accept a new credential. Is the program expecting to create a new kind of health professional that can focus on preventive health from a number of disciplinary perspectives? In our opinion, the allied health sciences have gone to great length over the last decade or so to further delineate the scope of their professions and to refine the training programs for them. It is not clear on what basis this potential program thinks that a different kind of allied health professional would be widely employable.

In a similar vein, the audience for this program is also not clear. The entry level degree for professionals in physical therapy and occupational therapy is already the doctorate; and the doctorate is becoming more prominent in terms of rehabilitation therapy. The program proposes to draw on professionals in this field for its student audience. To us, it is a question if these potential students would be willing to pursue another doctorate.

Finally, we think there would be significant overlap between the content of this program and the existing programs in PT, OT, Bioenergetics, Medical Family Therapy, and Health Psychology. At the time of our visit, it was not clear whether this program was sufficiently differentiated from the existing ones to justify its approval. In retrospect, we are not sure that it can be differentiated or that it should be. If, in fact, there is room in the market for a new professional credential along these lines, we think it would be best pursued in the context of one or more of the existing programs.

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College of Human Ecology

Medical Family Therapy

We begin this assessment of the doctoral program in Medical Family Therapy with two observations. The first is that, to our mind, the program is a wonderful idea and the kind of therapist it aims to produce is sorely needed, especially perhaps in the region the University serves. The second observation is that the college developed the Ph.D. program long before it was actually ready to do so. Despite the innovation embodied in this program and the seriousness of the social need it will address, we wonder if East Carolina University will decide that it can afford to pioneer this field once the actual costs of launching and maintaining the program are known.

We are unable to estimate the costs of launching and maintaining the program on the basis of the information we have, but they will certainly be significant: lines and start-up costs for senior research faculty, reduced teaching loads for current faculty who need to begin or ratchet up their research programs, research space, clinical space in close proximity to the medical school, and unquestionably, funding for the care of clients and patients, many of whom are likely to be indigent. We understand that many scholars in the field are looking to this program as a model for development, but the University will need to decide if the prestige of pioneering a new profession is worth the cost of doing so—assuming that the University can afford the cost.

As is the case with many of the programs participating in this study, the program in Medical Family Therapy is difficult to assess, precisely because it is a virtual pioneer in the field and, at this time, is the only program of its kind in the country.⁴⁸ The comparative cohort for the assessment consists, for the most part, of traditional programs in family therapy, none of which is an exact cognate to the East Carolina program, though this is the only option available to us.⁴⁹ The other difficulty is that since this is a Ph.D. program, we have no choice but to evaluate it in part on the basis of its prowess and potential in attracting external research grants; but the program faculty is wholly committed to an ideal of community engagement that implies action research—and action research is rarely capable of achieving significant funding, which is reserved almost exclusively for large-scale quantitative research studies.

Both the Director of the program and the former Interim Dean of the College indicated that program faculty have, over the last five years, written over \$1,000,000 in grant proposals but have thus far been successful in being awarded approximately \$50,000 in funding. From our point of view, this pipeline for grant funding is not nearly large enough, and proposal writing needs to be ramped up by some magnitude. We do, however, think that the current faculty strategy of teaming with principal investigators outside the program is viable and will eventually pay off, assuming an increase in proposal activity. But there is no question that, in order to gain the kind of funding that will be necessary to support the program, both existing and new faculty will need to commit themselves to the kind of quantitative research

⁴⁸ It and the program in Bioenergetics are the two University programs that present the most difficulty in terms of assessment.

⁴⁹ As was also the case with Bioenergetics, some of the family therapy programs in the cohort are tracks of programs of much larger scope, and comparative data was never available at the level of the track. This can make a significant difference in some of the performance indicators.

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that is necessary to secure large grants.⁵⁰ Unfortunately, we think this will involve a reduction in community engagement, and the faculty will need to discover a balance with which they can live between the two kinds of research.

A final comment before turning to the program's performance indicators: program faculty were very helpful in providing background material of various kinds, including the program proposal itself and the program's first-year review document. In reviewing these, we notice a confusion of purpose. The mission statement in the first-year review gives emphasis on preparing the future professoriate, while the request to establish the program primarily addresses preparing therapists. It would not surprise us if the program intends to follow both courses; but in our view, this is extremely over-ambitious and unwise. From our point of view, the choice is clear: the program needs to focus on training therapists who will be of service to the region. That alone will involve significant effort and expense, and if these pay off, the program can expand to the training of academicians at a later point. In our view, nothing could be more destructive to the program in these early stages when resources are tight than to stretch program faculty too thin by diffusing faculty focus.

Perhaps it is in order to be more direct about the matter: we think the program is far too ambitious for the resources it has available to it: four faculty, none of whose work is particularly grantworthy, is attempting to train both academicians and therapists with no start-up funds, little money for student support, and inadequate clinical and research space. In addition to this, some of the faculty's operational assumptions are naïve. In the first-year review, faculty identify no fewer than 12 program objectives, state that students will be required to experience 1000 hours of direct client contact, and express the expectation that students will secure their own grants to fund dissertation research—and indicate that students will complete their degrees within three years of matriculation. Our best guess is that time to degree will be at least double what faculty project.

In terms of size, the program is very small, with four FTE faculty versus a cohort mean of 13.3 faculty. As we indicate in note 49 above, several of the cohort faculties undoubtedly include faculty from other tracks in programs with a much larger academic scope than simply family therapy. Even if we remove these outliers, however, the ECU faculty would still be only half the size of the cohort mean. Though current resources are undoubtedly placing a cap on program enrollment, the program is still under-enrolled relative to the cohort, with four students (or one per faculty) versus a group mean of 36.1 students (or 3.1 per faculty). Student quality appears to be relatively high, however. The average annual combined GRE score is 77 points above the mean combined score, though we wish the program's average verbal score were higher than it is. Degree production is not an issue at this point, since the program is too new to have produced any, though as we indicated above, we think there will be issues with time to degree and this will undoubtedly have a negative impact on degree production.

In terms of research performance indicators, we must first highlight a discrepancy. The program reported, as we have stated several times, a five-year grant income of \$50,000 (or \$12,500 per faculty). Institutional Planning and Research gives a five-year average annual

⁵⁰ Currently, faculty are having considerable difficulty supporting doctoral students, both in terms of assistantships and travel funds for conference presentations. The program is concerned that it needs to redirect funding that traditionally was used to support master's students, but to us, this is one of the consequences of having a doctoral program; and as we indicated in the general section of this document, the University needs to create a plan to gradually transition the bulk of its master's students to self-funding.

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research income of approximately \$329,000 (or \$82,250 per faculty). Whichever figure is correct, research income is significantly below the mean for the cohort: approximately \$2,000,000 (or \$671,000 per faculty). The publication record is similarly lackluster. Against a mean cohort of 604 papers published (or 72 per faculty), the East Carolina program published 198 papers (or 50 per faculty); and the citation record is dismal: a cohort mean of 1,906 citations (or 207 per faculty) versus East Carolina's record of 379 citations received (or 95 per faculty).

On competitive indicators, the program fares much better. The doctoral stipend for ECU is \$20,000 versus a cohort mean of \$12,560. Perhaps the stipend is so high because the program is closely affiliated with the University's medical programs, but it seems to us that this is an area from which some resources could be diverted to other pressing needs.

Space, as we have already mentioned, is an issue. We were not able to obtain research space data for all the programs in the cohort, but for those for which we did, the average square footage is 19,725 net assignable square feet. The ECU program has 520 NSF. The first-year review document states that the program has picked up an additional 33,000 square feet through the expansion of the Rivers Building, but it is not clear how much of this is research space.

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Brody School of Medicine

Introduction

Before turning to the assessments of the doctoral programs in the Brody School of Medicine, we wish to acknowledge the graciousness and hospitality with which we were received by administrators there, particularly George Kasperek, Assistant Dean for Ph.D. Education, and John Lehman, Associate Dean for Research and Graduate Studies in the Brody School of Medicine and Associate Vice Chancellor for Research in the University Division of Health Sciences. They did an excellent job of preparing programs for our assessment visit and of orienting us to graduate programs in the Medical School.

As senior University administrators indicated during our first meeting on campus, doctoral programs in the School of Medicine are far advanced relative to ECU's other doctoral programs. This is in part because they are older, more established, and better funded than many of the programs with which we met. It is also, however, a result of BSOM's ability to develop powerful research programs that are directly responsive to their local and regional environment. In general, these programs are related to the study of metabolism, but there are specific applications to the study of obesity, diabetes, human movement, and preventive medicine. Our comparative sense is, in fact, that the University has the potential, in the short term, to become the country's leading research center in these issues.

From all appearances, this is an exciting time for the Health Sciences Division at ECU, though it is not without its difficulties. During the time of our visit, the division was embarking on a strategic planning process that was designed to address several serious challenges. There is a need to do foundational work with clinical faculty, many of whom are not sufficiently engaged in research. The current Dean of the Medical School has inherited a significant budget deficit, severe enough to prevent some programs from having an operating budget, and this situation has been complicated by the fact that new state fiscal policies are reducing or eliminating payment to the medical center for the care of indigent patients who, unfortunately, comprise a significant part of the center's patient base.

In addition to these challenges, there has not yet developed a sufficient culture of research and self-support among biomedical faculty, some of whom continue to feel a deep sense of entitlement to state support. Finally, despite new building programs, many of BSOM's programs are hampered by both a serious inadequacy of clinical space and by the overly cumbersome bureaucracy related to accounting, hiring, and contracts that we discussed above in the general section of this document. This bureaucracy, as we have said, is a serious issue for the University in general, but it is particularly prohibitive to the conduct of biomedical research and education. The program assessments which follow have attempted as much as possible to take into account these contexts.

At the start of this project, several senior University administrators asked us specifically to address the question of whether critical mass issues in BSOM's basic sciences programs could be addressed by merging the various programs into one integrated biomedical sciences program. Ultimately, we think this is the appropriate solution not only for the critical mass issue but to optimize the interdisciplinary research being performed in the medical school's signature areas. However, the overwhelming feeling of both biomedical program faculty and BSOM administrators is that the programs are not ready for integration at this point, primarily because of a faculty concern about the erosion of the traditional biomedical disciplines; and we see little sense in imposing a structure that has the potential to create disruption, especially in light of the challenges currently being faced by the Health Sciences Division.

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It happens that BSOM has a plan to introduce a new master's program in integrated biomedical sciences, which we support, since this seems to be an ideal mechanism to prepare a workforce for the region's nascent biotechnology industry. Our sense is that the better course to follow is to allow faculty engagement in the integrated master's program to convince them that an integrated doctoral program is a sound idea and a preferable alternative to the small and sometimes fragmented programs now being offered.

We have not reached this conclusion without misgivings, however. As we will discuss in greater detail below, faculty concern to prevent the erosion of the traditional biomedical disciplines has in some cases produced programs that feature significantly outdated science, and we think that this situation is at least partly responsible for the relatively flat external research income that these programs are earning.

Anatomy and Cell Biology

The doctoral program in Anatomy and Cell Biology is in a state of transition, spurred on by the University's hiring of new leadership for the program. That transition appears to be focused on the transformation of a teaching mission to a research mission, though it is clearly in its beginning phase, and the program's performance indicators demonstrate that there is still a long way for the program to go.

At the time of our visit, the program's new leadership was only beginning to feel its way. When asked about its principal research strengths, for example, the program responded with particular disciplinary techniques and methodological approaches or with very general topics such as cellular adhesion. This is a model appropriate for very large and comprehensive departments, whereas our sense is that for ECU to achieve excellence in small programs, it will need to be much more focused and precise: the cell biology of diabetes, for example. The program also significantly over-reported to us its grant record, claiming research awards of between \$1,000,000 and \$2,000,000 per year. The reality is that its grant achievements, according to the Office of Sponsored Programs, is closer to \$400,000 per year.⁵¹

The materials provided by the program are noteworthy in two ways. First, they focus on teaching, which is, after all, the principal focus of most anatomy departments, particularly in community-based medical schools. Second, the promotional literature for the program addresses itself to students who are only vaguely aware of what anatomy and cell biology are, as though they were written for lower division undergraduates exploring possible majors. The materials are not of the sophistication necessary to build a major biomedical research enterprise. Even the program plan for senior hires is focused on satisfying the teaching needs of the department and indicates, as we have already mentioned, that the department has a long way to go in establishing a research program of national importance.⁵²

In terms of number of faculty, the program is about half the size of the mean for the comparative cohort—14 faculty versus 28.2—though two the programs in the group (the ones

⁵¹ Part of the supporting documentation with which the faculty provided us was a list of research grants awarded from 2000 through April 2006. This contained literally only 11 grants. One of the program's benchmarks, Virginia Commonwealth, had more than 100 grants during the same period. The ECU program's research earnings are only about 10% of what they should be.

⁵² The program's most recent strategic plan, while also focused on teaching, indicates a new element: territoriality. One of the principal objectives of the plan is to bring all labs and equipment related to anatomy under department control.

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at Ohio University and the University of Wisconsin Milwaukee) are only slightly larger. The program is exceptionally under-enrolled, however. It has the smallest doctoral enrollment of the comparative group—6.3 versus the group mean of 39.2. The mean doctoral-student-to-faculty ratio for the group is 1.8 students per faculty; this program has 0.45 students per faculty. Students appear to be of reasonable quality, however, since the three-year average GRE scores are significantly above the cohort means for both the verbal and quantitative sections of the test. Despite above average students, degree production is in line with enrollment: very low, with only three doctorates granted in five years (0.2 per faculty) versus a cohort mean of 16.5 degrees (0.7 per faculty).

Performance indicators for research are very unfavorable. Apart from the program at the University of North Dakota, the ECU program's average annual research earnings are the lowest in the comparative cohort--\$398,000 (\$28,000 per faculty) versus a cohort mean of \$2.4 million (\$94,000 per faculty).

Publication productivity is less straightforward to discern. The count we developed from the science index struck us as too high, given our other knowledge of the program and the program's own listings of its publications. The high count (still listed in Appendix D) turned out to be the result of the unusually large number of journals in which program faculty have published, indicating a scatter-shot approach to research, with no discernable focus at all. The program's own count seemed to us too low, but we were able to confirm it through BOSM administration. Using the program's own count, therefore, we note that the average faculty member in this cohort published 26 papers over a five-year period, while ECU faculty published 5.4 papers. The bibliography provided by the program indicates that most of their publications are abstracts, which the National Research Council will not count as research publications, or textbooks, which reflect the traditional teaching mission of the program.

On a more positive note, the program's competitive indicators are generally excellent. The stipend of \$21,500 is very competitive in terms of the cohort, which has a mean doctoral stipend of \$18,685, though we are concerned that not all students appear to be getting full tuition remission. The program does provide full health insurance coverage, and the time to degree of 4.5 years is the shortest in the cohort, which has an average time to degree that is a full year longer.

Biochemistry and Molecular Biology

The doctoral program in Biochemistry and Molecular Biology is very well managed, accustomed to benchmarking itself against external aspirational peers and very much on top of the important details of the program, including having explicit written policies that govern the allocation of fellowships and assistantships. The program also appears to be of very high quality, having placed some of its graduates in very prestigious locations. When the program fell upon hard times in the 1990s, it behaved very strategically and chose areas of focus that have made a great difference to both its scholarship and its productivity, a wise course of action for a program that is relatively small and limited, because of size, in what it can do well. As a result of establishing research focus, it loses approximately half the students in which it is interested simply because the program is unable to accommodate their research interests, but we are confident that those students who do enroll in the program are receiving a very high quality education.

The department also appears to have completed the transition from a primarily teaching department to greater research orientation. Faculty leadership understands how to accomplish the program's research and scholarship goals, and makes good and concerted efforts to mentor junior faculty in establishing their research programs in order to achieve

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appropriate levels of external funding. Though the program's performance indicators are mixed, it is clearly moving in the right direction; and we think that the primary benefit of this exercise for this program is that it will establish higher productivity standards, which we are confident the program can achieve.

To turn to performance indicators, the program is—by any measure—very small, with only 10 faculty versus a comparative cohort mean of 22.5.⁵³ Though we understand the availability of student financial support drives enrollment for this and every other program in the Brody School of Medicine, we note that the program is under-enrolled relative to the cohort, with a doctoral enrollment of 6.3 students (or 0.63 per faculty) versus a cohort mean of 32.1 students (2.4 per faculty). We have mixed opinions about the quality of the program's students, however, since the three-year average combined GRE is lower than those of any other program in the cohort except for the one at Northern Illinois University. The program's academic placements are, as we have already indicated, quite good; and so either the GRE scores are giving a false picture in this case or the program is particularly good at taking average students and turning them into high achievers.⁵⁴

Degree production for the program is very low—three doctorates (or 0.3 per faculty) in five years, versus a cohort mean of 18.1 doctorates (or 1.5 per faculty). We know that the program had an attrition problem in the past, which is now solved, and it is possible that this problem is reflected in this data. It is possible that the program has a degree completion issue, though the indicators are inconclusive on this point.

Performance indicators for research are mixed. As the program leadership indicated to us, faculty need to do much better than they currently do in external funding. The average annual research income for the cohort is approximately \$2.6 million (or \$195,000 per faculty), while the ECU program is earning \$725,000 pre year (or \$73,000 per faculty). The publication record—almost unique among ECU doctoral programs—is excellent, however. Apart from the program at Virginia Commonwealth, the ECU program has the best publication record in the comparative group; and on a per-faculty basis, it has the best record, publishing eight more papers per faculty than VCU and about double the mean number of papers in the group. On a per-faculty basis, they are cited more than any other faculty except the one at Virginia Commonwealth. The relationship between papers and citations between the two programs is very interesting, however. Because of its large faculty size, VCU is cited far more than any other program in the group, but its faculty, on average, receive only 3% of the total program citations. The faculty for the ECU program each receives 10% of the program's total citations.

We do think that the program has a problem with research space. Average net assignable square footage for the cohort is almost 31,000 square feet. This program has only 10,480 square feet. Other competitive indicators are, for the most part, good. The doctoral student stipend is well above the mean for the cohort, though IPA reports that some students do not receive full tuition remission, which is essential in this field; and time to degree, though not bad, is slightly above the mean for the cohort—6 years versus 5.9 years.

⁵³ There are several outliers in the comparative group, either because the programs themselves are exceptionally big relative to this cohort or because they are tracks within integrated programs of much larger scope. Even if we remove the figures for these outliers so that the mean group faculty size is 15.5, the ECU program is still very small.

⁵⁴ Whatever the case, we think the program deserves better students and might experiment with requiring for admission a minimum GRE score of 1100 or 1150 to see what effect that has on student quality.

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Interdisciplinary Program in Biological Sciences

Of all the basic science programs in the Brody School of Medicine, we are most concerned with the interdisciplinary doctoral program in Biological Sciences. At the time of our assessment interview, program leadership was relatively new, and it is possible that this skewed the program's presentation of itself, but our sense is that there are much deeper issues here.

The current program was created in 1999 in order to replace a previous program that was failing; but after eight years, it is clear to us that the program still lacks a coherent research identity. On the most practical level, we think the reason for this is that the program has become a magnet for ambitious faculty who want a doctoral program of their own but do not have one; and, in many senses, the various segments of the faculty (chemical and biological, for example) are acting as though they are separate programs.⁵⁵ An additional issue is that programs like this in other universities, programs of this type ordinarily have an environmental focus. So far as we can tell, this program combines an interest in coastal and estuarine sciences and proteomics, areas which are too far apart to fit coherently into a single program.

Because program faculty are unable to agree on a research focus—or even, perhaps, a common pedagogy—the program design features an individual plan of study approach—plans of study which are different, of course, for biology and chemistry. Our experience generally is that individual plans of study—versus defined curricula—lead to exceptionally long time to degree; and, in fact, this is a serious issue for this program: the average time to degree is seven years, considerably longer than both the average time for the cohort and the national average for the biosciences.

An additional problem is the program's preference for accepting only those students who already have a master's degree, which is way out of line for the national practice in the biological sciences. We think this has the general effect of attracting weaker students to the program. The program did say that it considers approximately 80% of the students who apply to it qualified for admission and reports that most of the students who are offered admission do in fact enroll, though the program has lost at least one potential student to another institution and says that some students decide not to enroll because they decide not to enter a Ph.D. program after all. We think that the root cause of this is that the program is more likely to attract potential students whose research interests are insufficiently defined to pursue doctoral studies; and finding no apparent direction in the program that might refine their own interests, they decide not to bother.

This lack of coherent research identity has several practical consequences. The first is that it makes program faculty unconfident about their own prospects for funded research, and they are consequently skittish about accepting students who they might not be able to support over the course of the entire program.⁵⁶ The second is that program faculty have no definitive sense of what they are attempting to train for, and our feeling is that the biological

⁵⁵ In fact, the assessment interview was attended by about five faculty in addition to John Lehman, and our sense is that the additional faculty came because they did not trust program leadership to represent their own part of the program adequately.

⁵⁶ The new program director stated repeatedly during our assessment interview that he could not confidently accept students without greater assistantship support from the University—without realizing, apparently, that almost all doctoral students in the biosciences are supported, for the most part, from faculty grant funds.

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and chemical sections of the faculty, if asked who they were trying to train and why, would give significantly different answers. In this context, it is not surprising that program performance indicators are generally poor, despite the participation in the program of faculty who are, to all appearances, good at what they do and committed to doctoral education.

Current faculty FTE for the program is unbelievably small relative to the comparative cohort—five ECU faculty versus a cohort mean of 30.⁵⁷ Despite small faculty size, however, the program has a high doctoral enrollment. In the context of this discussion, we think it is over-enrolled, with a doctoral-student-to-faculty ratio of 2.1 students per faculty versus a cohort mean of 1.1 students per faculty. Despite this situation, the program appears, based on average three-year GRE scores, to be getting students as good as any other program in the cohort, but as we have already indicated above, our concern is that their research interests are ill-defined relative to doctoral students generally, and this undoubtedly accounts in part for the program's exceptionally long time to the doctorate. Not surprisingly, degree production is *very* low, with only one doctorate produced in the last five years (0.2 per faculty) versus a cohort mean of 16 doctorates produced (0.5 per faculty).

The average annual grant earnings for the program are, in our view, not adequate to support a viable doctoral program. Average program earnings for the cohort are in excess of \$4,000,000, while this program earns approximately \$882,000 per year. On a per-faculty basis, research earnings appear higher than the mean, but as we have said, we mistrust this figure because of the unusual FTE count. In terms of publications, the program trails some of the big biomedical establishments in the cohort, such as the one at Virginia Commonwealth, but they appear to be ahead of some of the smaller integrated bioscience programs, such as the ones at Florida International and Northern Illinois. If we were to include the publications of all the affiliated faculty, they would have, by far, the lowest publication record in the cohort. Research space is also an issue for the program, since it has only 3000 square feet—versus a mean of approximately 46,000 square feet for the entire cohort.

The doctoral stipend is excellent. At \$21,500, it is appropriate for doctoral programs in the biomedical sciences but high for programs with an environmental focus. It appears that some students do not receive full remission of tuition, and this is a serious issue. The provision of full health insurance benefits for students is certainly a plus, though time to the doctorate, as we have already stated, is exceptionally high and needs to be shortened by more than a year.

Microbiology and Immunology

The doctoral program in Microbiology is somewhat puzzling in terms of its research mission and its actual research operations. Among the documentation we examined for this program is its list of five-year grant titles; and this list gives evidence of both fragmentation and an odd interdisciplinarity—odd because some of the grant titles in the list are of the sort that we would expect to find in other departments of the Medical School but there is no evidence—either in the grant record or in our assessment interview with the program—of research collaboration outside the department. We certainly do not see interest in some of the larger research strengths of the Health Sciences Division, such as metabolism, diabetes, and

⁵⁷ Institutional Planning and Research reports that the program has 44 affiliated faculty on a headcount, but it is not clear how much affiliated faculty actually participate in the program. As a result, we are concerned that if we were to use that figure, all of our per-faculty counts, would be artificially high or low.

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obesity; and so it is not clear what this program it attempting to build—unless it is a traditional large and comprehensive department of Microbiology and Immunology. As a result, we find that the program lacks the kind of coherent research mission that we have found in such programs as Bioenergetics and Biochemistry and Molecular Biology.

This lack of coherent identity is reflected in the program's performance indicators. It is not a small faculty by any means. At 21 FTE, it is exactly in line with the comparative cohort mean of 21.4, and it is significantly larger in terms of faculty size than many of the programs in the cohort: Florida International, University of North Dakota, University of Wisconsin Milwaukee, and Wright State. Its doctoral enrollment is very small, however—15.7 students (or 0.175 per faculty) versus a cohort mean of 38.9 students (or 2.5 per faculty). Moreover, its students appear to be of lower quality relative to the rest of the cohort. Its three-year average GRE scores in both verbal (505) and quantitative (526) are both significantly below the cohort means—522 for verbal and 590 for quantitative. These are among the lowest GRE scores in the cohort.

As a result of both under-enrollment and low GREs, degree production is very low: 11 degrees for the program (versus the mean of 21.7) and 0.5 degrees per faculty (versus the mean of 1.4).

Research performance indicators, though relatively low for the comparative group, are better than those of many of the ECU programs we have examined. On average, program faculty should be earning about double what they current are in grant income. The average annual grant income for the program is about \$1.6 million, versus \$2.2 million for the comparative group. Average per-faculty earnings for the ECU program are approximately \$76,000 per year, against a cohort per-faculty mean of \$161,000 per year. The publication record is better. On the whole, program journal publications are above the mean for the group (632 over five years versus 563 for the cohort); but on a per-faculty basis, performance is somewhat lower: 30.1 for ECU faculty versus 39.1 per faculty for the cohort. Moreover, ECU faculty research appears to be relatively uninfluential. Citation counts are consistently below the means for the comparative group on both a program and a per-faculty basis. Research space also appears to be an issue. The average net assignable square footage of research space for the cohort is 41,548. NASF for the ECU program is approximately 18,500, less than half the mean for the cohort.

Program competitive indicators are excellent. The program is fully competitive in terms of full tuition remission, a doctoral stipend of \$21,500—versus a mean of \$18,956 and one of the highest stipends in the cohort—and time to the doctorate, at 5.3 years, is slightly shorter than the mean for the group: 5.5 years.

Unique among programs at ECU, the program appears to be very sophisticated at recruiting students and uses careful and meticulous recruiting practices, though we think these efforts are confined to narrowly to the region and should be more national in scope. We think the program would benefit from a faculty retreat, the purpose of which would be to define a coherent research mission that is better aligned with what is happening elsewhere in the Brody School of Medicine.

Pharmacology and Toxicology

The doctoral program in Pharmacology and Toxicology, like the one in Anatomy and Cell Biology, is in an obvious state of transition, in part because of new program leadership. In the case of this program, however, the transition is far enough advanced to be making a difference, and the program's performance indicators are beginning to reflect this. Part of

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this transition is the reintegration of toxicology into the curriculum. Some challenges remain, however.

We begin by noting that faculty research interests in the program are not appropriately aligned with the best research strengths in the Brody School of Medicine. This is probably because the program has chosen to hire, over time, one or two faculty working in a number of areas—too many areas, in our view—including cancer biology, drugs of abuse, and neonatal pharmacology. We would prefer that faculty be massed in larger research groups and that these groups deal largely with the principal themes of the University's Health Sciences Division: metabolism, diabetes, and obesity.

The most significant problem we see, however, is that much of the program's practice of its discipline is outdated, as evidenced in the program's repeated use of the phrase "from molecule to bedside." This datedness is partly the result of an over-emphasis on translational research, which is of far more importance in this program than in any other Pharm and Tox program with which we have dealt. We think it is also in part an effect of the community-based medical school's traditional teaching mission, since whole-animal biological science appears to be widely favored by teachers, for pedagogical reasons that we are unable to understand.⁵⁸

This problem of dated science was touched upon, though only lightly, in the program's most recent external review, which recommended that the department devote significantly more attention to areas such as genomics, proteomics, and stem cell biology—in short, to those areas of the biosciences made possible by advances in molecular biology. We wish to state the case more emphatically here. The adherence to traditional biological techniques at the expense of newer approaches to the life sciences impedes the progress of research, and most definitely has a negative impact on the program's ability to earn external grants. Moreover, the continued teaching of outdated science is, in our view, harmful to students, since it will diminish their prospects of achieving productive careers in research. From our point of view, it is vital that the program embrace contemporary biomedical science, even if it means completely forsaking the traditional paradigm of whole-animal biology.

In turning to performance indicators, we begin by stating that, since there were relatively few Pharmacology and Toxicology programs in the official comparative cohort for this study, we were forced, as we were with many programs, to search for cognate programs at other institutions, giving preference to those in the University's official peer group. The specific result in this case is that we are necessarily comparing the ECU program with Pharmacology and Toxicology programs at some of the best academic medical centers in the country, including Texas Tech, Buffalo, Alabama Birmingham, and Louisville. The effect of this is that the program may appear worse in comparison than it actually is, especially in light of some of the changes being implemented by new program leadership.

In terms of program size, the faculty—at 10 FTE—is about half the size of the mean for the comparative group, though the mean may be artificially high because of the presence of institutions such as Louisville and VCU, which both have unusually large programs in this area. The typical faculty size in the cohort is about 13 or 14, and the ECU program is obviously smaller than that. Despite this, the program is enrolling as many students as it

⁵⁸ The program objectives listed in the various documentation we reviewed read very much like the program objectives one would find in a description of an undergraduate program. They are very much focused on teaching, and this, in our opinion, is a distraction from the development of a coherent program research mission.

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can—or close to it. The mean doctoral-student-to-faculty ratio in the cohort is 1.1, and this is precisely the ratio for the ECU program. Current students also appear to be of high quality, since the three-year average GRE scores for both the verbal and quantitative sections of the test are significantly higher than the cohort mean. For verbal, the ECU program averages 552 versus a group mean of 516; for quantitative, the ECU program averages 704, versus 656. However, doctoral degree production is low; though we agree with the most recent external review that these figures probably reflect a problem of the past rather than the present.

As the external reviewers noted, research performance indicators for the program are far lower than they should be. On a program basis, research earnings are only about 25% of the mean earnings for the cohort. Per-faculty earnings are about half the mean for the cohort. Though we have said this already, it bears repeating: we are convinced that low grant productivity is a direct result of the program's outdated practice of its discipline, and will not increase until the program changes its orientation to its science.

The publication record tells the same story. On a per-faculty basis, the program's five-year publication volume is only 70% of what it needs to be to achieve the mean level of the cohort; and faculty are receiving only half the citations they should be. Again, we expect that low citations are the result of the program's science.

Though the quantity of research space is generally an issue in the Brody School of Medicine, in this program, it appears not to be. In fact, the program has one of the highest space allocations in the cohort. At 10,222 net assignable square feet, it is significantly above the cohort mean NASF of 8,555.

The program's competitive indicators are excellent. The doctoral student financial package is fully competitive at full tuition remission and student health insurance and a stipend of \$21,500. The program's average time to degree of 4.8 years is quite good, and one of the shortest times to degree in the cohort.

Physiology

The doctoral program in Physiology is rationally and well-managed from an administrative point of view, though it reports that it is more dependent than it would like to be on international students and our impression is that it is, on the whole, not happy with the quality of its students or the rate of its growth.

As was the case with the program in Pharmacology and Toxicology, our principal concern for the Physiology program is that it is outdated in the practice of its discipline, giving too much emphasis, in our view, to whole animal physiology, though the program reports that it also pays some attention to molecular science. Our sense is that the reason for such datedness is the same as it was with the other program. The department of Physiology has heavy service instruction obligations to the programs in nursing, occupational therapy, physical therapy, and nurse-anesthetist. Unquestionably, the datedness has the same effect on this program as on Pharmacology and Toxicology: its research income is not nearly what it could be; and consequently, it is unable to support the enrollment growth it desires. In this case, we think the solution to the problem is comparatively more simple than it is for Pharmacology and Toxicology. The Physiology program reports that it has some interest in neuroscience. We think it should have a lot of interest in neuroscience, hiring faculty specifically in this area

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as positions open up; and if the program develops in this direction, we feel confident that its approach to its discipline will update without a great deal of trouble.⁵⁹

The program's performance indicators are about what we would expect from a program with an outdated approach to its discipline and that is reluctant to recruit students. The program is small relative to others in the comparative cohort—in fact, the second-smallest—with an FTE faculty count of 14 versus a cohort mean of 26.5. As the program indicated, it is under-enrolled, with a doctoral-student-to-faculty ratio of 0.76 students per faculty against a group mean of 1.3 students per faculty. To illustrate the severity of the under-enrollment issue, we note that a smaller faculty at the University of South Carolina enrolls 38.7 students (versus this program's 10.7) and a faculty only slightly larger at Virginia Commonwealth enrolls more than 50 students.

As the program also indicated, the quality of its students is relatively low. Three-year average GRE scores are well below the means for both the verbal and quantitative sections of the test, and total a combined score of 1124, the lowest in the cohort. Interestingly, department faculty reported that students who have a combined score of below 1500 tend to struggle in the program, so that these figures confirm our sense that the faculty is not happy with the quality of the students it is getting. Degree production is low, but the completion rate appears to be high. Our sense, therefore, is that low degree production is a function of low enrollment.

The program's research performance indicators are its weakest suit, unquestionably—to us—because of the program's emphasis on whole animal physiology. Average annual research income for the program is approximately \$1,000,000, only 35% of the mean figure for the cohort. On a per-faculty basis, annual research earnings are \$72,449, about 45% of the group mean of approximately \$162,000 per faculty. Because of small faculty size, the program's number of publications is significantly low, but the per-faculty publication record makes the more important point: ECU Physiology faculty publish only about 38% of the number of papers published by the average faculty member in the comparative group. The per-faculty citation record speaks directly to the problem of research currency: ECU faculty receive fewer citations than almost every other program in the cohort—349 per faculty versus a group mean of 1,519 per faculty. As with other programs in BSOM, the quantity of research space is a serious issue. This program, partly as a result of its building being found in violation of federal regulations, has a net assignable square footage of 12,000 versus the mean cohort NASF of 29,000.

As with other programs in the Medical School, competitive indicators are generally excellent. There is full tuition remission and full subsidization of student health insurance, though we are concerned that time to degree is too long by about half a year. This is probably a reflection of student quality.

⁵⁹ Making this transition will definitely improve the department's ability to recruit. Program faculty report that they are currently reluctant to recruit because funding is so uncertain. With a more current approach to science, we expect funding will become both greater and more regular. Developing some strength will also help to plug a hole in the Division of Health Sciences, which has never really done much in terms of neuroscience.

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College of Nursing

In assessing the new doctoral program in Nursing, we note with interest that the description of the program provided by the Dean of Nursing to one Yardley Group interviewer was very different from the description provided by the program director to another interviewer. It is not that the descriptions are incompatible; but it is notable that while the program director focused specifically on the quality of education and its impact on clinical care, the Dean spoke principally of the research prowess of the program, particularly in terms of post-operative care for gastric bypass patients. We think it is important that faculty practice be more thoroughly integrated with the strategic vision of the Dean. There is no reason why the doctoral program in Nursing at East Carolina cannot come to be regarded as the premiere program in the country to develop specific nursing specializations.

The program's performance indicators, reflecting its youth, are mixed. In terms of size, the East Carolina program has the smallest faculty in the cohort, with 11 FTE versus a cohort mean of 23.9. Doctoral enrollment is, therefore, also small; but the doctoral-student-to-faculty ratio of 1.34 is significantly above the comparative cohort mean of 1.0, and ECU nursing faculty are training more doctoral students per faculty than all but two of the more established programs in the group. We think this bodes well for the future of the program.

The quality of the program's students could be better than it is, but this is also probably the effect of the program's youth. The program has the lowest three-year average combined GRE score in the comparative cohort, with ECU students demonstrating particularly deficiency in mathematics. We are unsure of the significance of these indicators, however, since many nursing programs nationwide, including some in this comparative cohort, do not require the GRE at all. Whether student quality will have an impact on degree production, it is too early to tell, since the program has thus far had time to graduate only one student. We would look for a degree completion rate at the end of this academic year of about 55%. A rate lower than this would indicate that something is amiss.

Performance indicators related to research are primarily positive. We do note that we have discrepant research figures. The official figure reported to us by Institutional Planning and Research is lower than the one cited in the Office of Research and Scholarships' Annual report dated May 1, 2004. In using the IPR figure, we note that average annual research income for the program is respectable but about \$350,000 below the mean figure for the cohort. This is reflective of program size, however. Individual ECU nursing faculty earn, on average, \$82,475 per year in grant income—against a cohort mean of \$59,137 per year. The publication record is similar. Because of small program size, the program's five-year publication volume of 309 papers is slightly below the cohort mean of 328 papers. On a per-faculty basis, however, the program bests every other program in the cohort except for the one at Virginia Commonwealth, with 28.1 publications per faculty against a group mean of 14.7 papers per faculty. The program also boasts more citations per faculty than any program in the cohort except for the one at VCU. The quantity of research space is currently an issue, since it is less than half of the mean square footage for the program; but we assume this problem will be alleviated when the program moves into its new space on the medical campus.

Competitive indicators are also primarily positive. Though not all students receive tuition remission, the doctoral stipend is the highest in the cohort and nearly \$5000 above the mean stipend amount. Time to degree, though based on only one student, is thus far excellent.

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College of Technology and Computer Science

Doctor of Technology Systems

This proposed doctoral degree had completed its request to plan document at the time of our visit to campus. We have both reviewed this document and met at length with the Dean of the College and the Director of the proposed program.

In our view, the program documentation to date is excellent, demonstrates that there are strong markets both regionally and nationally for the program, and indicates clearly that College administrators have thoroughly investigated both the amount of investment required to launch the program and the amount of time it will take for the program to pay back the investment.

We believe that this potential program fits perfectly with ECU's mission of service to the region and could have a significant impact on the region's existing manufacturing and production services base.

We do, however, think that one question needs to be better answered. Why does this program need to be a professional doctorate rather than a professional master's? What financial and other benefits will accrue to graduates of the program because their degree is a doctorate rather than a master's?