The Department of
Mathematics Education

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Date: September 17, 2004

To: University Curriculum Committee
From: Patricia S. Wilson <pwilson@coe.uga.edu>
Department of Mathematics Education

Subject: Involuntary Dissolution of the Department of Mathematics Education

In response to a request from Jan Hathcote, I have enclosed two reports that explain our rationale for remaining a Department of Mathematics Education. These reports explain why we believe that dissolution of our department is not in the best interest of the College of Education or our department.

The first report, Rationale for Remaining an Intact Department, was submitted to Dean Castenell and forwarded to Provost Mace on May 24, 2004. We were told that Dr. Mace would consider requests from any departments that thought they should not be merged under the reorganization of the college. I have included the list of Appendices to give the committee a sense of the documentation we have submitted through the reorganization process, but I have not included the actual documents that were included with the report. They are available if the committee would like to review them.

The second document, Memo to the COE External Review Team, is a report that we wrote for the external review committee that was convened to study the proposed reorganization of the college. Each department was invited to submit a statement. This committee was convened in November. Our vote opposing dissolution of our department was in April. Although we submitted a statement to the committee, the external committee did not meet with our faculty to discuss our programs, our students, or our departmental concerns about dissolution. The committee did meet with faculty and groups with the college (e.g. faculty senate, department heads) in intra department meetings.

Please let me know if you have any other questions. We would like to send a member of our department to the curriculum committee meeting.

Thank you for your invitation, on Tuesday, September 14, 2004, to share our rationale.

Rationale for Remaining an Intact Department

Submitted by the
Department of Mathematics Education
May 24, 2004

Mission of the College of Education

The mission of the College of Education is "to provide the highest level of leadership in furthering education, communication, life long learning, and health and well-being for all citizens." As both a research institution and a land and sea grant institution, we must serve our state and nation as we educate our students. The faculty of the College takes this university responsibility very seriously. The COE has brought more external research funds into the university than any other college except agriculture and arts and sciences. The majority of teacher education students were in departments with graduate programs that were ranked third in the country (i.e., elementary education, secondary education). These rankings are directly linked to the respect for our content-focused programs that are product of our departmental structure. Our College is accomplishing its mission with a high degree of success, but we are always interested in improving. Minor restructuring of the COE could improve a few programs, but a case for each change should be made with attention to academic quality and the optimal use of resources. It would be tragic if a massive reorganization were to undermine the current reputation and successes of the College.

Although we believe that it would be most helpful to review rationales and plans for the proposed mergers, we have been asked to prepare a rationale for why successful units need to remain intact. The following statement provides a rationale and examples of the contributions of the Department of Mathematics Education to the College of Education and its mission. We have organized our comments around the four requested areas. We have tried to keep this response brief and focused on what was requested. We have attached appendices containing previous statements that provide more details.

Rigorous, Academically Sound Reasons for Remaining Intact

Schools in Georgia are structured around academic disciplines, and teachers are certified in those disciplines. Consequently, one of the most powerful and efficient way to work with schools and meet certification requirements is to organize by disciplinary units. Such an organization has been and continues to be a major strength of the College's teacher education program. It sets us apart from most other colleges of education, giving us a unique character that is attractive to those who value subject matter in the schools. Furthermore, it facilitates our work with cognate departments in the Franklin College of Arts and Science.

At a time when national groups are calling for more attention to teachers' academic content knowledge, mergers of disciplinary units will detract from the reputation of our College as a place where content knowledge is valued. Most of the faculty members and graduate students in teacher education were attracted to UGA because we had disciplinary departments in the College. In our current structure, we can meet the demand for pedagogical content knowledge that is necessary for preparing better teachers. In merged departments, the focus on content will be diluted.

The Department of Mathematics Education is like other departments in teacher education. It is synonymous with leadership and innovation. Not only have we made major contributions to the journals, monographs, and books concerning mathematics education, our former doctoral students are among the outstanding academic leaders in mathematics education. We continue to produce the most competitive students for positions at Research I Institutions. We continue to be in the forefront of the discussions of the mission and vision of our College. Our reputation and track record allow us to promote programs, outreach, and service across the state. Our "brand name" gives us advantages in recruiting, and we must protect our status and reputation if we are to keep current faculty as well as attract highly qualified new faculty and students. The loss of retiring faculty is a necessary difficulty, but a loss of department status and reduction to program status would make maintaining and building our programs much more challenging if not impossible. A merged department would make us much less visible to all who seek our expertise.

How Maintaining Our Current Successful Unit Benefits the College

A merger of the Department of Mathematics Education with any other department in the College will necessarily, and in a highly visible fashion, diminish the University's efforts to improve mathematical literacy in the schools of Georgia and the rest of the nation. The most compelling arguments for retaining, and indeed strengthening, our department and its focus are academic, fiscal, and political.

The academic arguments have to do with our response to requests to prepare teachers to meet the challenges of the twenty-first century. Colleges of education across the nation are under increasing scrutiny from the public and politicians because, despite decades of effort, major problems persist in our schools, including disparate levels of achievement by students from different demographic groups. Moreover, colleges of education, particularly those in public universities, are seeing faculty lines left vacant and budgets cut. In short, we are being asked to do more with less. At the same time, the No Child Left Behind Act now measures schools' progress toward higher educational standards for all by testing in two academic areas: *reading and mathematics*. No Child Left Behind comes at a time when the field of mathematics education has made significant progress in understanding and making practical contributions to classroom teaching and learning. By maintaining an identifiable Department of Mathematics Education, our College can meet the demands for specialization in mathematics for

mathematics teachers and expertise in mathematics education for those who prepare teachers. Our high quality programs at both the graduate and undergraduate levels will help our College meet the needs of our state and nation. We are in the right place at the right time, and we are prepared to do the work.

The fiscal arguments have to do with our ability to help the college increase its revenues and get out of the red. Maintaining our department status will cost no more administratively than merging it with another department. We have managed to increase revenues primarily through increased hours in the undergraduate program, dual majors, credit-hour production in graduate programs and enhanced extramural funding—all of which will be facilitated by maintaining our identity as a separate department. We are also concerned about the additional costs of massive reconstruction of the College. Modest restructuring that reduces administrative costs and pares administrative duties might reduce costs in these difficult economic times, but massive reorganization will be expensive in terms of operational funds, external funding, faculty, and students. In order to maintain some academic integrity, department heads of merged departments would need to appoint knowledgeable program directors and graduate coordinators. The only proposed savings is related to converting department heads from 12 month to 9 month contracts which can be done without a merger. We are convinced that we can operate more economically if we are structured as a department, managing our own funds and workload.

There is also a financial concern related to securing funding for our work within the state and nation. External funding supports more than 80% of our graduate assistants and the majority of faculty travel. External funding that has come to the Department of Mathematics Education is the product of an identifiable faculty with expertise in mathematics education. For example, COSTAR and CPTM are grants that were funded ($1 million + $10.2 million) because of a commitment that included a focus on improving mathematics learning. Major grants to COE such as GSTEP ($6.5 million) and PRISM at UGA ($5.3 million) require expertise in content areas and collaboration. The Department of Mathematics Education has collaborated on these grants from the proposal stage to the current implementation. Individual faculty members have collaborated with school districts, other COE faculty, and UGA faculty to secure significant external funding. In each case, our faculty members have been asked to bring content expertise and the department's reputation for high quality research.

The political arguments have to do with the value of maintaining the status and visibility of mathematics education in the college and the university. The plan to maintain a Department of Mathematics Education is good educational politics. Mathematics continues to be a critical indicator of the effectiveness of schooling and a gateway to higher education. Given the rapid, dramatic changes in achievement and accountability standards described in our plan’s rationale, keeping our department intact would reaffirm the University of Georgia’s commitment to leading the state and nation in meeting the challenge to make high-quality mathematics education available to all students.

As an example of the challenge, the current draft revision of the Georgia Professional Standards recommends a new integrated approach to high school mathematics and drastically new and demanding standards for elementary and middle school mathematics. These standards oblige our department to respond to the needs of Georgia teachers of mathematics if they are to teach mathematics in a way that will raise the achievement of all pre-college students to the levels envisioned. Responding adequately will present a major challenge to the faculty of mathematics education, and a merger would dilute our efforts to respond decisively and well. Our goals cannot be implemented in a merged department. Demoting the current Department of Mathematics Education to a program would signal that the university was turning its attention away from the challenge of improving school mathematics.

How the Current Structure Addresses the Need for Curricular Integration

Politicians, the public, and policy makers at all levels are expressing increased concern about the subject-matter knowledge of students and their teachers. The current department structure will allow us to strengthen our role as the department to turn to on issues of school mathematics policy and practice as well as for cross-disciplinary projects such as state standards, field experiences, or teacher induction. In Georgia, we currently work productively with the Board of Regents on professional development, the Professional Standards Commission on certification, and the Department of Education on performance standards and assessment. We want to continue to be the faculty whose expertise they seek.

Collaboration is a key element in the success of our College and of integration across the curriculum. Collaboration is valuable when it brings together components of expertise. It makes little sense for people with similar expertise to collaborate, because the strength of collaboration comes from its diversity. Independent units of expertise such as disciplinary departments offer the expertise that promotes good collaboration across departments and strengthens the College. Merged departments lack the ability to maintain the focus on content that leads to better collaboration across content areas. We currently collaborate with all of the programs preparing teachers, as well as with several other departments and programs in the College.

Another important type of collaboration is integration of curriculum across colleges. We are successfully working with the Department of Mathematics and the Department of Statistics. We have joint graduate seminars, shared colloquia series, paired courses for undergraduates, and joint externally funded grants. This substantial integration of curriculum is successful because of the similar goals, discourse, and content expertise that are a product of disciplinary departments.

Aspirant Institutions That Have a Similar Structure

It is difficult, if not impossible, for most Colleges of Education to attract enough faculty and graduate students to have vibrant disciplinary departments. UGA has been able to attract faculty and students because it is fortunate enough to have disciplinary departments. We believe that other institutions do aspire to our successful organization.

- In 2000, Brigham Young University established a department of mathematics education. Before doing so, the university brought in a group of consultants (including a faculty member from our department) to discuss and evaluate the idea. The university liked what they heard about the value of a separate department. They subsequently hired one of our new doctorates to work in it. Last fall, for an external review of the functioning of the department thus far, they called in a faculty member from our department and one from a department of mathematics to evaluate the program. We recently learned that both the external review and an internal review were positive, and the department seems poised to grow and flourish.

- There are departments of mathematics education in all of the following institutions, many of which are located in countries that have scored at or near the top in international comparisons of mathematics achievement:
    - Shimane University, Japan
    - Aichi University, Japan
    - Tokyo Gakugei University, Japan
    - Shinshu University, Japan
    - Hiroshima University, Japan
    - Yamanishi University, Japan
    - Nara University of Education, Japan
    - Seoul National University, Korea
    - Korea University, Korea
    - Yeungnam University, Korea
    - Chonnam National University, Korea
    - Hongik University, Korea
    - Kangwon National University, Korea
    - Gongju National University of Education, Korea
    - Korea National University of Education, Korea
    - Dongguk University, Korea
    - Ewha Women's University, Korea
    - National Taipei Teachers College, Taiwan
    - National Taichung Teachers College, Taiwan
    - University College in Bergen, Norway
    - Gothenburg University, Sweden
    - University of Warsaw, Poland
    - Charles University, Czech Republic
    - Comenius University, Slovakia
    - Salzburg University, Austria
    - University of Granada, Spain

    - University College of Education of Winneba, Ghana
    - Haifa University, Israel

- Teachers College, Columbia University, once had a separate department of mathematics education but through reorganization mathematics education was combined with science and technology education. Unfortunately, that change reduced their productivity and their ability to address content-specific issues. It is not surprising that they do not have one of the new Centers of Learning and Teaching that have been funded by NSF.

Many universities whose education schools or colleges rank near or higher than UGA's have only graduate programs or have little presence in mathematics education. Understandably, these institutions rarely have the critical mass that would allow a department of mathematics education. In the interests of fair comparison, we should look to peer institutions that have both graduate and undergraduate programs as well as a significant presence in mathematics education.

Some of these institutions have attempted to organize a mathematics education group within the department of mathematics in a college of arts and science (Illinois State University, University of Arizona) or within a department of curriculum and instruction or of teaching and learning in a college of education (Indiana University, University of Maryland, University of Wisconsin–Madison, Vanderbilt University). In many ways, this structure is more expensive than our current structure because a separate program head, graduate coordinator, and undergraduate coordinator are necessary. Several universities have established "centers" in order to simulate departments and to organize the faculty around a research and service mission in mathematics education (University of Missouri, Michigan State University, San Diego State University). Colleagues at these institutions aspire to forming a department like ours at UGA but have not been able to achieve a critical mass of faculty and students.

The President of the National Council of Teachers of Mathematics summed up the views we have heard from many colleagues in other institutions. The issue is not just about mathematics education. Disciplinary departments are an important part of the solution for education in the United States. In an unsolicited letter Dr. Johnny Lott wrote:

> A concern to me as an outsider is that the very structure that has allowed excellence to grow in Georgia's mathematics education department is apparently about to be subsumed into a different structure. This is troublesome. An exemplary department in its own right that produces the type of research being demanded by the *No Child Left Behind Act* is apparently being morphed into something else at a time when we need stability and good examples at the university level. I urge you not to take this action. The nation needs your stable and quite productive example for others to follow.

Rationale for Remaining an Intact Department

Submitted by the
Department of Mathematics Education
May 24, 2004

Appendices

The Department of Mathematics Education
April 3, 2003

This is a description of our department presented to the COE Committee on Reorganization in response to their request for information on departments.

Shared Goals
July 22, 2003

This is a list 5 goals that were presented by the Department of Mathematics Education and the Department of Science Education to Dean Castenell.and shared with Provost Mace.

Concerns related to Teacher Education under Reorganization of the College of Education
February 28, 2004

This is a list of concerns and questions presented to Provost Mace and shared with Dean Castenell.

Memo to the COE External Review Team November 13, 2003

From the Faculty of Mathematics Education

We in the Department of Mathematics Education do not oppose a reorganization of the College that would equip it to meet changing educational needs, maintain academic integrity, and reduce administrative costs. We do, however, oppose the current wholesale reorganization with respect to both the way it has been conducted and its consequences for our department. Although the reorganization process has been open in the sense that faculty members have had a chance to react to various plans and proposals, it has been closed in the sense that (1) the mandate to reorganize was never explained, (2) the Reorganization Committee was placed under heavy and arbitrary constraints, (3) departments were not allowed to consider alternatives to merging, (4) financial savings have never been spelled out, and (5) no poll or vote of the faculty has been taken regarding the reorganization plan sent to the Provost. We especially object to the unwarranted argument to the effect that departments should be combined because all should "share the pain equally." We briefly summarize our concerns here and, for amplification, refer the review team to copies of correspondence from faculty, students, and alumni of the department regarding the proposed reorganization (see http://jwilson.coe.uga.edu/ematextrev.htm).

Financial Savings

Administrative costs cannot be significantly lowered simply by reducing the number of department heads (33% administration), especially as long as more full-time administrators are being hired and additional faculty time is needed to keep programs running. Although we have almost no information on relative financial costs or benefits, we offer the following observations on the proposal to merge our department with the Department of Science Education:

- The two departments would likely incur the same or fewer administrative costs as separate departments than if we were merged. Administrative costs do not lie entirely with department chairs, and a department twice the size of the two would likely require an associate chair as well as directors for various programs.
- Given the size and nature of our programs in mathematics education, a merged department would still need a graduate coordinator and an undergraduate coordinator for mathematics. These coordinators need specific knowledge of the mathematics and professional educational requirements for degrees and for certification as well as the ability to interpret the diverse backgrounds of entering students.
- The need for support personnel for budgetary, secretarial, and administrative duties would not be much less than what both departments currently have.

In the absence of data, we can only conjecture that any savings would be minimal. Neither department has been given the opportunity to examine other options for making financial savings.

Academic Integrity

One of the greatest assets of the College is its set of discipline-specific departments, which has allowed, over almost four decades, the growth of strong content-based programs in elementary, middle, and high school education. The consistently high ranking of the College's secondary education programs is due in no small measure to departments that focus on the disciplines of the school curriculum. We do not accept the argument that because mathematics and science have often been paired historically, mathematics education and science education ought to reside in one department:

- Mathematics educators and science educators work in distinct fields that have different traditions and are organized differently.
- Mathematics and science are separate school subjects that are treated quite differently in educational policy.
- There is much more synergy between our department and the mathematics and statistics departments in Arts and Sciences and between Science Education and the science departments than there is across our two departments. Collaborations with mathematicians have contributed greatly to the stature of our current program. Such collaboration does not often happen at universities with general education programs.
- The Department of Mathematics Education is arguably the preeminent department in the field. Its faculty members are leaders in virtually every national and international organization in mathematics education, and its alumni hold positions in major universities throughout the world. Over the past two

> decades, our department has produced more doctorates in mathematics education than any other residential program in the country. Over nearly four decades, the department has received many major grants and attracted students and numerous visitors from across the United States and abroad. Its hard-won reputation would be put at risk, if not ruined, by a merger—as would that of the Department of Science Education.

In view of the size and nature of the Department of Mathematics Education and of the Department of Science Education, the caution expressed by the Reorganization Committee is especially relevant: "The merging of programs representing different disciplines reduces academic integrity of the department as a whole." Neither financial savings nor academic integrity was fully and openly addressed in the reorganization process. We believe that any serious consideration of these two fundamental issues would not support the elimination of our department.