

ON PRIORITIES FOR DEVELOPMENT OF RESEARCH AT  
GEORGE MASON UNIVERSITY

A Working Paper

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by

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Being a young institution, George Mason University has a long way to go in developing its research activities. While we are behind in one sense, since other universities have large head starts and reputations, we are ahead in another sense. We are not burdened with lots of vested interest in outmoded research.

Among other things, we can try to focus on building clusters of research capability--of centers where several faculty work together to help build rapidly a reputation for quality research. This focus need not prevent and may even enhance the capacity of the isolated individual who wants to work alone to do so at George Mason.

Nevertheless a focus on developing research centers should help us achieve several important objectives. One is image building; to show that we have strength in particular areas. Another is quality--to focus several people in areas of discovery--which should help us turn out work that has benefited from internal discussion, review, and amendment before being submitted to public scrutiny. A third is to get funding of the size that can only be obtained by several faculty working together. And finally it should help us in attracting graduate students.

As we move toward these objectives, we need to be as efficient and thoughtful as possible, to avoid false starts and retracing of steps. It will help if we think through our priorities.

We know that we cannot have groups of people working together on research without funding, space, furniture, and secretarial assistance. In many cases we will require specialized equipment. Because we are an educational institution, we need to involve graduate students in the research and, in some cases, undergraduate students.

Of course we have to have the most important thing: faculty who are dedicated to obtaining research funds and carrying out the research.

Let us consider each of the factors in the light of our special circumstances at George Mason University.

1. FACULTY. We have a group of faculty with research interests. Most of them have just been here a relatively short time, and have not established research activities; especially in information technology. This is a great advantage in terms of forming centers.

However because of our location in the metropolitan area around Washington, there are many, many consulting opportunities for faculty; or for jobs that can be called consulting, but which in a strict sense are second jobs or moonlighting.

Rather than treat this situation as something to be policed, let us note that the very competent researcher is not likely to respond favorably to bullying, even when it may be warranted. Rather what must be done is for the institution to make the conditions for carrying out research so attractive that those who genuinely want to do high quality academic research will decide that the place to do it is on our campus and not in one of the companies or federal laboratories that abounds in this area. We may note also that as long as these outside agencies can get the faculty at wage rates, there isn't much incentive for them to put research dollars at GMU.

Therefore we must give the greatest possible attention to answering the question of how to make sure that our research faculty find this institution a congenial and efficient place in which to conduct research.

We should remind ourselves from time to time that none of the universities in the D. C. area has an excellent research reputation among the rest of the U. S. and international academic community. They all suffer from the points made above.

2. GRADUATE STUDENTS. In Information Technology and Engineering, there was much glee at having enrolled 57 doctoral candidates when the early target was 10. However we must note that apparently only 2 or 3 of these students are full-time graduate students. At schools that carry on good research, we require about 2 Ph. D. students per faculty member and perhaps 4 M. S. students per faculty member. We are a very long way from having this kind of graduate student population, at least in Information Technology and Engineering.

Therefore we must put great emphasis on recruiting graduate students to work with our faculty. Even those well-known research institutions in engineering get most of their graduate students from the international population, with emphasis on southeast Asia. Most Americans who get undergraduate degrees in engineering do not go on to graduate school as full-time students. They can make a good salary with a bachelor's degree. Or their company will pay their bill for going to graduate school part time. Because there are so many companies in this area who want to pay for part-time graduate education of their engineering employees, we can expect that GMU is in a great position to have a large part-time graduate student enrollment with negligible contribution to ongoing research. This is nothing to get excited about. It would be a miracle if it didn't happen.

What we must work very hard at is to get a collection of Americans who are willing to go to graduate school full time. This is an achievement that even the top schools would tend to envy.

3. RESEARCH SPACE (with furniture, equipment, and staff support such as secretaries).

The individual researcher has a very hard time doing research in his regular academic office. Usually he will take time off and do it at home. This is why we see so few truly good academic teams doing research.

But as we have said above, that is exactly what we need to get at George Mason.

If you have teams, you need to have them contiguous, and in space that supports their research activity. At present, this is almost impossible at George Mason University, because we are operating at 52% of state guidelines on space. But that doesn't mean that we can't make it happen. What it means is that we have to be ingenious in making space where none exists.

4. FUNDING. For the reasons given earlier, it will be difficult to get funding for research at George Mason University. However we can make it a lot easier to get funding if we do the right things.

Funding is most likely to come and keep coming when:

- The faculty morale in research areas is high
- The things that make morale high are present
- When money comes, the research is done promptly, with high quality, and published in reputable journals, and described in meetings of strong societies

#### SUGGESTED PRIORITIES

In order to have good research with good funding and good products, we can't just imagine bringing some of the necessities on line at one time and others a few years later. Somehow we need to get them all going at the same time. Still, there must be a sense of priority. How can we work this out?

#### 1. SPACE: THE TOP PRIORITY.

We must make it clear to faculty that there will be space where they can work contiguously on research, in an environment that is congenial to research, competitive with that offered in the companies around this area, and in which there will be compatible colleagues.

Under the assumption that GMU is not in a position to make space available, at least in a very timely way, it seems clear that we have to bootstrap it.

The proposed arrangement is along the following lines. Given that we can rent commercial real estate reasonably close to GMU for \$20 per square foot per year, we can see that if we allocate 200 square feet per person, the cost per person per year is \$4,000. This amount of money could be obtained if the person were paid \$8,000 to do research during the year and if GMU received 50% overhead on this salary. In other words, the absolute minimum research support for personnel that would pay for space for the researcher is \$12,000 per year.

Now this figure does not allow for any contingencies, nor does it allow for any sharing of overhead among the various parties that

like to receive overhead from research. On the other hand, without space, there is no overhead to share. It is for this reason, primarily, that space seems to be the number one priority, given that we already have faculty who are capable of doing research.

On the other hand, for many reasons it doesn't make sense to allocate all overhead obtained from new research to pay for space. Strictly as a rule of thumb, perhaps we could say to the faculty something like the following: if you bring in \$30,000 per year in research funds, and have no space suitable for your research on campus, you will automatically win a ticket to space off the campus for as long as your research continues at the mentioned rate.

But what about accomodating a research team and their graduate students? If we take a minimum-sized team of perhaps three faculty and six graduate students, we are talking in the neighborhood of \$250,000 per year as a grant or contract amount that would be appropriate to justify moving the project into the off-campus space.

Assuming that these ideas do not seem unreasonable, we still have not solved the space problem because there remain questions of timing. We are told that once an agreement to lease for a year has been signed, we may normally have a 60-day delay before the space can be occupied. Also there may be additional expenses for furniture, computers, copiers, telephones, etc.

Should we not strive to anticipate the need for a lease, and go ahead and lease some space in anticipation of the need for it? A MASTER LEASE would allow GMU to lease a building and then sublease parts of it. If we staggered subleases so that we had expirations every two months or so during a year, we would never be more than two months away from having space opening up for research, provided we allowed tenants only 60 days notice or less before terminating their leases.

If we don't want to lease a whole building, then perhaps we could lease a floor, if we can establish a high probability of grants or contracts coming in. Or perhaps we could even convince the CIT to pay for such a lease, if they could see the logic in having space as our top priority.

## 2. FULL-TIME GRADUATE STUDENTS--A SECOND PRIORITY.

Given that we have faculty qualified and experienced in doing research. Suppose that we have ample space, adequately equipped at least for paper-type research (i.e., research done largely at one's desk and through interaction with colleagues), not requiring expensive technical equipment; how do we stand then?

There are two reasons why we are still not in good shape, both having to do with the shortage of full-time graduate students. On the one hand, the faculty have to do everything, and since they are part-time on research this means that progress is likely to be rather slow. Also it means that tasks that are essentially routine for them, but which would be great learning experiences for graduate students have to be done by faculty.

This arrangement is undesirable, from the faculty point of view.

But moreover, as we are an educational institution, we are really obligated to involve the graduate students (and sometimes undergraduate students) in the research. We cannot do this much now because we don't have the students.

Conversely, if we had the students, we couldn't have them working on a research team with faculty very conveniently if we had no space. But if we have space, then we are ready to grow the graduate students into research colleagues.

Again, if GMU has little funds to bring in graduate students, then why not take the state monies saved as a consequence of putting faculty part-time onto research projects, and use it to hire graduate students. This is a bootstrapping formula much like the one for getting the space, except that the source of the funds is modified somewhat.

Finally, in order to get graduate students to come here, the faculty are going to have to go out and recruit them. Here is another way we will have to use funds; probably taken from the same overhead monies that we use to get the space. Of course if faculty don't recruit, we might build up a sufficient number of graduate students in ten years; but we are talking about SOON.

We must keep in mind that we want our faculty to stay on campus or as near as possible to do their research, and not go gallivanting out to some company or federal installation.

But our faculty won't recruit if they don't see the opportunity to do research. This is why we have to give them assurance that

- a) The space will be available
- b) Money will be available to pay for the graduate students
- c) Money will be available to pay for their travel to recruit full-time graduate students

This set of circumstances should be sufficient to stimulate motivated faculty to move as quickly as possible in the research area.

If we do this well, there will come a time when we no longer need to base our progress on bootstrapping.

### 3. EQUIPMENT FOR RESEARCH--A THIRD, AND MUCH LOWER PRIORITY

Research involving information technology often involves expensive equipment that may become obsolete soon. We don't have the money to do everything we might like.

If we don't do anything involving equipment, there is a great hazard that our work will be much too academic to be useful. But there are several answers to this issue that don't require significant expenditures:

- a. We can probably make deals with local companies to use some of their equipment on a part-time basis at no cost.
- b. We can probably use mainframes and microprocessors to do a lot of the research, thereby saving a lot of money that would otherwise be needed; which suggests that it is wise to invest in these areas to make usage very convenient to the researcher.
- c. If special equipment is needed, we may often be able to get it free; which says that we need to build up a budget for maintenance--an expense that is much lower than initial purchase for many kinds of equipment.
- d. The most common rule should be that the sponsor must provide the necessary equipment as part of the grant or contract.

With these potential solutions available, we can see that equipment should really be very low on the priorities compared to space and full-time graduate students. On the other hand, we have to work on equipment availability to prevent the research from being sterile.

#### 4. OVERHEAD INCENTIVES--A FOURTH PRIORITY

We are a long ways from steady-state in research, and we cannot expect to have an overhead policy that ignores the dynamics of our research buildup; such as we might get if we copied an established research university.

Nevertheless we have to realize that we are competing with established universities for research faculty; and that there are certain benefits to getting incentive-type overhead returns to those parts of the university that work hard to bring in research dollars. Among these include simply the human factor of recognizing that while some of the overhead goes to other purposes, at least some of it comes back to allow the appropriate researcher, chairperson, and dean some discretionary funding. Without the special freedom that can be gained with return of overhead money, some of the most useful actions associated with continuing and growing research activity are inhibited or prevented.

Therefore, I believe, it is important to distribute parts of overhead funds to the researcher, to the department, and to the school, or other component of the university, in order to allow them to enjoy certain appropriate activities that they couldn't undertake without it, such as:

- Giving small, special encouragement to faculty that need something special to help them get started in research
- Pay for overseas travel to scholarly meetings, or for travel in-state as a supplement to other travel funds
- Allow payment for meals for visitors that may become sponsors or that may become faculty, or in other ways may help the research
- Allow for printing brochures, etc., or letterheads, to give more visibility to what is happening
- Allow payment for visiting speakers for seminars