

## Faculty Directors' Comments on MAPs – Summer 1999 through Summer 2001

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Reports by faculty directors on approximately 160 MAPs were analyzed. The count is approximate because some faculty directors report on several students at once and it was unclear whether to count each report or each student.

76 different professors have submitted reports on MAPs. They represent 18 different academic departments. The largest numbers of MAPs have been done in the departments of biology, chemistry, mathematics, and anthropology (all of which had active student research programs before the MAP program was developed). 60% of the reports analyzed came from the science division, 25% from social studies, and 15% from the humanities.

|             | Total | Science | Social Studies | Humanities |
|-------------|-------|---------|----------------|------------|
| Summer 1999 | 46    | 33      | 11             | 2          |
| Fall 1999   | 8     | 6       | 1              | 1          |
| Spring 2000 | 8     | 2       | 3              | 3          |
| Summer 2000 | 35    | 25      | 8              | 2          |
| Fall 2000   | 11    | 4       | 5              | 2          |
| Spring 2001 | 18    | 5       | 7              | 6          |
| Summer 2001 | 34    | 22      | 5              | 7          |
| Total       | 160   | 97      | 40             | 23         |

### What Students Do

Descriptions of the students' activities varied greatly in detail, so the counts reported below are not very accurate. David Lopatto's summer research reports probably provide better data on what types of activities MAP students actually do. Also, in certain disciplines for which I am unfamiliar with the research processes (genetic studies in particular), I was sometimes unsure how to characterize the activities described. However, I present the table below as some indication of what kinds of things students are doing, and as a rough approximation of their relative frequencies in different disciplines.

|                                  | Total | Science | Social Studies | Humanities |
|----------------------------------|-------|---------|----------------|------------|
| Design study                     | 30    | 21      | 7              | 2          |
| Learn background skills and info | 27    | 19      | 7              | 1          |
| Manipulate conditions            | 28    | 27      | 0              | 1          |
| Create research tools            | 35    | 27      | 7              | 1          |
| Code/transcribe data             | 11    | 4       | 7              | 0          |
| Literature search                | 39    | 17      | 12             | 10         |
| Tangible product                 | 30    | 20      | 4              | 6          |
| Collect data                     | 85    | 65      | 18             | 2          |
| Analyze data                     | 98    | 58      | 29             | 11         |
| Solve problem                    | 20    | 20      | 0              | 0          |

Notes: Most reports did not say whether or not students participated in project design. Creating research tools includes things like preparing tissue samples or designing a survey instrument. Creating a tangible product includes synthesizing a chemical where that was the object of the study, composing a piece of music, writing software, building a piece of equipment, or designing a curriculum. "Analyzing data," in the humanities and in some social studies projects, refers to the analysis of texts. Solving problems is used here exclusively for mathematics research.

### Obstacles Encountered

Obstacles reported that could be expected as part of the normal research process in that discipline were not counted here (such as having difficulty synthesizing a chemical or finding people to interview).

|  | Total | Science | Social Studies | Humanities |
|--|-------|---------|----------------|------------|
| Student inexperience/<br>slow learning curve | 22    | 16      | 5              | 1          |
| Project scope too large                      | 18    | 14      | 4              | 0          |
| Equipment malfunction                        | 14    | 12      | 0              | 1          |
| Bad student attitude                         | 10    | 6       | 3              | 1          |
| Building<br>maintenance/space                | 10    | 8       | 2              | 0          |
| Coordinating schedules                       | 9     | 4       | 5              | 0          |
| Illness/emergency                            | 7     | 3       | 2              | 2          |
| Transportation                               | 4     | 2       | 2              | 0          |
| Funding logistics                            | 3     | 2       | 1              | 0          |

### Faculty Time

Not everyone counted their time in the same way. Some counted only direct student contact hours, some counted preparation time as well, and some did not report a specific number. Some professors working with more than one student reported only the total time spent with all the students.

| Hours per Week | Total | Science | Social Studies | Humanities |
|----------------|-------|---------|----------------|------------|
| 1-2            | 38    | 10      | 15             | 13         |
| 3-5            | 27    | 12      | 9              | 6          |
| 6-10           | 41    | 35      | 6              | 0          |
| 11-15          | 21    | 18      | 3              | 0          |
| 16-20          | 8     | 8       | 0              | 0          |
| Over 20        | 12    | 11      | 1              | 0          |

### Faculty Scholarship

Projects were only counted as contributing to the faculty member's own scholarship if a direct productive connection was described or claimed. A number of people said that they had learned new things about a topic in some way related to their research interests, but this was not counted as a direct contribution.

|     | Total | Science | Social Studies | Humanities |
|-----|-------|---------|----------------|------------|
| Yes | 90    | 70      | 18             | 2          |
| No  | 64    | 24      | 21             | 19         |

In general, MAPs that require more faculty time are more likely to contribute to faculty scholarship.

| Faculty Hours per Week | Do NOT contribute to scholarship | DO contribute to scholarship |
|------------------------|----------------------------------|------------------------------|
| 1-2                    | 29                               | 8                            |
| 3-5                    | 14                               | 13                           |
| 6-10                   | 6                                | 35                           |
| 11-15                  | 7                                | 14                           |
| 16-20                  | 3                                | 5                            |
| Over 20                | 1                                | 10                           |

### Completed or Expected Output

Academic papers were usually complete at the time the report was filed. Oral presentations and posters to be presented on campus generally appeared to be definite. Conference papers/posters and journal submissions were in the future and perhaps not all of them happened or will happen; however, both of these were counted only if the faculty director sounded fairly certain that this would happen (not just “I will encourage the student to submit a poster”), and if the student would be the presenter/author or co-author (it did not count if the professor presented the work or would publish it later).

|                                | Total | Science | Social Studies | Humanities |
|--------------------------------|-------|---------|----------------|------------|
| Academic paper                 | 91    | 48      | 27             | 16         |
| Oral presentation on campus    | 77    | 39      | 24             | 14         |
| Poster on campus               | 76    | 72      | 2              | 2          |
| Conference presentation/poster | 58    | 41      | 13             | 4          |
| Journal submission             | 37    | 26      | 11             | 0          |
| Other                          | 29    | 8       | 9              | 12         |

“Other” includes performances, web sites, annotated bibliographies, proposals, user manuals, and organized events.

### Follow-up Planned (with the same student)

A number of faculty supervisors expected to continue the same project later with a different (as yet unidentified) student. This answer was counted as “no” in this table, since the extent of the student’s MAP experience is the focus of this question.

|     | Total | Science | Social Studies | Humanities |
|-----|-------|---------|----------------|------------|
| Yes | 81    | 49      | 22             | 10         |
| No  | 78    | 48      | 17             | 13         |

### External Review Planned

Here, “yes” includes competitive submission by the student (as author or co-author) to an external conference or a journal, or presentation of the work by the student orally or in writing to professionals not employed at Grinnell College.

|     | Total | Science | Social Studies | Humanities |
|-----|-------|---------|----------------|------------|
| Yes | 73    | 49      | 16             | 8          |
| No  | 86    | 48      | 23             | 15         |

### Changes Recommended

Most individuals said they did not plan to make any changes in how they did research with students.

|   | Total | Science | Social Studies            | Humanities |
|---|-------|---------|---------------------------|------------|
| Need more preparatory work                | 9     | 5       | 3                         | 1          |
| Have students work in teams               | 5     | 5       | 0 (some already in teams) | 0          |
| Have students do more literature research | 4     | 4       | 0                         | 0          |

### Reflections on the MAP Program

Everyone who answered this question said it provided a good experience to students. There were some qualifications of that general approval:

- 24 said that the MAP program was not visibly different from previous ways of organizing student research.
- 16 said that student funding was very valuable, and that it was important to include funding for student travel to conferences.
- 12 mentioned the importance of faculty compensation, either in course-release time or money. Many of these indicated that the current level of compensation is not at all commensurate with the level of faculty time and effort required.
- 10 said that only top quality students should be accepted to pursue MAPs. One pointed out that there should be a procedure to deal with students who fail to do adequate work (terminate the project, rescind the student's funding).
- 4 suggested the need for MIPs (mentored introductory projects) for rising sophomores, and for these to receive faculty compensation equivalent to MAPs, on the grounds that lower-level students require, if anything, more mentoring than advanced students.

|                      | Total | Science | Social Studies | Humanities |
|----------------------|-------|---------|----------------|------------|
| Not different        | 24    | 20      | 2              | 2          |
| Student funding      | 16    | 8       | 7              | 1          |
| Faculty compensation | 12    | 7       | 3              | 2          |
| Only top students    | 10    | 3       | 5              | 2          |
| Need MIPs            | 4     | 4       | 0              | 0          |

Minor points made by only a few individuals include:

- The difficulty of training students while doing research that is genuinely productive for oneself as a professional.
- MAPs should not have to be interdisciplinary.
- Students should design their own studies.
- Students should not design their own studies; they should come out of faculty research.
- Early deadlines for independent studies will cut out opportunities for good fall research projects that build on summer work.
- It should be possible to hire a lab assistant as a job that is not intended to provide "researcher" experience for the student.

### Emerging Themes

- (1) The need for the MAP experience to extend over more than one unit of time (semester or summer). One common activity that students perform is the learning of background skills and information. The most common obstacle to success is student inexperience and the slowness of student learning curves. The next most frequent is that the project scope was too large for the time available. The most frequently mentioned change desired was for students to do more preparatory work prior to the MAP research experience. Half the students continue working with their MAP director on some aspect of the same project after the official MAP ends.
- (2) As a subset of the above, the need for students to do more intensive literature research in support of their own projects. Literature searches are already a common part of MAP projects. Reading the literature is one common version of the "learning of background information" that takes time away from the doing of research. One of the few changes suggested was that some faculty intend in the future to devote more time to teaching students how to do effective literature research, and/or to

having students research the relevant literature more widely to provide a good context for their own research.

- (3) Faculty scholarship, time, and compensation remain issues. About two thirds of MAPs so far have contributed to faculty scholarship. This is most common in the sciences and least so in the humanities. Compensation of faculty directors, either with release time or money, was mentioned as an important component of the program, but many of those who mentioned it thought that the compensation offered did not adequately reflect the time required by MAP supervision. Time spent by MAP directors varies enormously, partly by discipline, so not every director is performing the same kind of work.