Emporium organization
Frank Quinn, 11/3/97

This memo collects observations about organizational structure in the Math Emporium. Issues involved in actually implementing such a structure will be the subject of a later memo.

The tasks to be done in the Emporium require a much greater diversity of skills and interests than traditionally encountered in a math department. It is vital for us to avoid preconceptions and understand clearly and realistically what each job requires.

As an example, consider the role of the supervisors. The key to instructional success in the Emporium is fast, personal help for students when they need it. This help ranges from a few seconds of technical assistance to an hour of tutoring. By-and-large the helpers do well when actually helping, but there are delivery problems. A few helpers stay focused all the time. But when business is slow some clump together to chat. Others drift off to check email or surf. Some helpers are unable or unwilling to remain on their feet even when demand is brisk. Some like to settle into long-term tutoring sessions. Some helpers make appointments with students, spend the whole duty period with them and never go out on the floor. These are managerial issues and dealing with them is the responsibility of the supervisor. They cannot be dodged by defining the perfect helper to be one that does not need supervision and firing all the imperfect ones: we must work with what we have. And a lot can be done. Helpers who want to roam the floor should not be assigned to test duty since they tend to wander away. But the ones who want to sit down are fine for test duty. If business is slow some helpers can be assigned to review software, or be given breaks. If business is heavy the ones who like long sessions need to be kept moving. And often the supervisor should not directly help students: they are better served if the supervisor stays in circulation and keeps things running smoothly. Some conclusions:

-- "supervisor" is a managerial, not an instructional position. A good model may be a floor manager in a department store.

-- Math faculty are selected for completely different skills, so many can be expected to be incompetent or unhappy as supervisors. They are also expensive compared to commercial rates for similar jobs.

-- an attempt to use student evaluations or other academic measures to rate supervisors would be counterproductive.

Possible organizational structure:

**Director.** Runs the show. Level: Senior faculty.

There are three divisions at the next level: courseware development and maintenance; hardware and systems management; and student-contact staff.

**A) Student-contact staff:**

1) **Supervisors:** manage helpers, tutors etc., assign tasks (e.g. testing), evaluate helpers. Level: graduate students or instructors in quiet times and for tutors, professional managers during medium- and high-use times on the floor.
2) **Floor helpers**: quickly deliver individual help to students at machines, call consultants or tutors when appropriate, offer extended help when workload allows. Level: qualified undergraduates, graduate students;

3) **Consultants, coaches**: on-call on the floor for difficult or specialized problems (Mathematica, Excel, higher-level courses) Level: unusually qualified undergraduates, graduates, faculty.

4) **Tutors**: offer individual or small-group help not involving machines. Level: qualified undergraduates, graduates, possibly instructors.

5) **help session or focus group leaders**: offer lecture-style help at scheduled times to anyone who wants it, or organizational support to "classes". Level: graduates, instructors.

**Notes**: jobs (2)-(4) are points in a continuum rather than discrete tasks. For instance in quiet times qualified helpers could be reassigned as tutors. This could greatly expand hours when tutoring is available. In heavy periods tutors and specialized consultants might be redeployed as floor helpers. On (5): students should not be required to attend help sessions, and sessions where attendance is required should be not involve instruction. We do not have the resources to offer both traditional classroom instruction and a vigorous computer-based system in a single course.

**B) Hardware and systems management.**

In this area tasks and required skills are reasonably well understood. The point to be made here is that they must report to the emporium director, not someone else. In a commercial business this would be regarded as obvious. Some unfortunate experiences with disconnected reporting chains here at Tech have shown that the principles apply to us too.

**C) Content and courseware development and maintenance.**

1) **Content developers**. At present people tend to focus on programming and software. But recall that a century of serious effort failed to produce a fully satisfactory calculus text. Similarly in CAI, content will be a problem long after programming becomes as routine as book publication. This is the core of the whole business. Level: senior faculty, experienced instructors.

2) **Pedagogy consultants**. Classroom teachers need both content mastery and teaching skills. In courseware development both are still vital, but need not be located in a single person. In particular we may have much to learn from people who understand how students learn, but are clueless in math. It is also vital to understand that this is a new mode of teaching, not a new mode of delivery for the old mode of teaching. A painful corollary is that teaching expertise may not be transferable: outstanding classroom teachers are probably not the best sources for CAI pedagogy. Level: appropriate expertise.

3) **Programmers**. These work with developers and consultants to develop templates, implement designs. Highest-quality work needed to reduce later problems with maintenance and upgrades. Level: professional-level, creative, careful programmers.