



The Academy Center for Teaching and Learning
Harvard Medical School

Classroom Learning Small Groups

Statement of the Problem

Medical knowledge is growing at a rapid pace; it is estimated that the quantity of biomedical information relevant to medicine doubles every 6-10 years. Despite this, the length of time students spend in medical school has not changed in the past 75 years. Coincident with the virtual explosion in medical knowledge, the growth of information technology enables individuals to find and/or confirm “facts” within seconds to minutes. In light of these developments, it is necessary for Harvard Medical School (HMS) to reassess the best uses of its most valuable resource – faculty time with students. In particular, there should be a re-evaluation of the relative emphasis given during teaching time to “content” versus “thinking skills,” to the transmission of facts versus the application of content to solve clinical and scientific problems.

Goals of HMS Education Addressed by Task Force

- To produce doctors who can apply knowledge to solve problems.
- To support the development of life-long learners.
- To produce doctors who can communicate and collaborate with their colleagues whether to care for patients, generate new medical knowledge, or effect policy.

Statement of Principles

In a scholarly community, all members have a responsibility to themselves and to others to prepare for and participate in educational sessions. One of the core values at HMS is the commitment to active vs. passive engagement with learning. We base the following principles on evidence from the cognitive and neurobiological sciences.

- Learning occurs through an interaction among 3 factors: personal characteristics, environmental characteristics and behavior.
- Encoding new information is enhanced when it is linked to prior learning and presented in a meaningful context.
- Memory is cued by context. Transfer of knowledge depends upon the similarity between contexts in which learning occurs and transfer is expected.
- Recall of information provides an opportunity for new and reinforced synaptic connections to be formed.
- The lower the faculty/student ratio, the greater the opportunity for active cognitive processing and critical thinking.
- Cooperation among peers enhances affective and cognitive development.
- Motivation is the product of both personal disposition and acculturation.

Small Group Learning Sessions: Recommendations

- Small group formats are best used for
 - Identifying gaps in understanding of basic concepts
 - Recalling and reinforcing information through problem solving
 - Plumbing the depths and exploring the breadth of a problem
 - Generating hypothesis
 - Testing assumptions in the context of others' knowledge, experience and perception
 - Collaborating with peers
 - Honing communication skills and learning to use the language of medicine
 - Receiving feedback and reflecting in action
 - Acculturating students how to “be” (think like and act like) a doctor
- The quality of classroom learning is proportional to the extent of out-of-class preparation.
 - Students should receive case materials in advance of group discussions.
 - Students should develop skills necessary to frame relevant questions and hypotheses.
 - Students should be expected to read supplementary material from appropriate resources.
 - The case discussion should generate additional questions/issues that require students to do additional reading and analysis.
- The tasks of learning should be continuous and cumulative across small group sessions, across instructional formats and between episodes of classroom and self-directed learning. In an integrated and developmental curriculum, course directors should collaborate on the design of instructional formats and materials, such as problem-based learning cases. One such approach would be to create “family cases” that students would encounter repeatedly over time (e.g., a multigenerational family that includes members with a genetic disorder). Such cases might demonstrate how a disease progresses (or regresses), and how social/psychological/cultural/economic/healthcare management issues affect the disease.
- Time should be allotted for metacognitive skill building and group process, such as reflecting on how well the group functions and how one's thinking and study skills affect one's own learning and that of others.
- Small group formats should provide a safe and supportive environment in which to be curious, explore ideas and take risks. However, safety should be balanced with high expectations of scholarship and professionalism. Not only should attendance be mandatory but evaluation should be based upon criterion-referenced standards of performance in 4 key areas: knowledge, critical thinking, cooperation with peers and professional behaviors.

- Students should be expected to model professional behaviors we expect of doctors throughout their lives.
 - Attending all sessions, arriving punctually
 - Preparing thoroughly by seeking information for oneself and for the group
 - Participating actively and productively
 - Avoiding competition with peers and facilitators
 - Respecting the perspectives of peers and facilitators
 - Being willing to admit to mistakes
 - Being willing to accept feedback
 - Providing feedback to peers and facilitators in a respectful and productive manner

- The structure and tasks of small groups should be designed to meet the goals of the course. Factors to consider include:
 - Size of group
 - Leadership of group (e.g., leaderless, student-led, faculty-led)
 - Mix of students (e.g., demographics, prior experience)
 - Agenda (e.g., faculty-directed study questions versus student-identified gaps in understanding)
 - Homework (e.g., preparation of a case, assigned readings, projects, problem sets, study questions versus open-ended reading)
 - In-class tasks (e.g., discussing a case to learn pathophysiology, solving clinical or policy problems, constructing concept maps, role playing)

- The structure and tasks of small groups should correspond to the developmental level of the students, allowing students to assume increasing responsibility for their own learning (e.g., moving from facilitated PBL case discussion to students supplementing course material with explications of relevant pathophysiological phenomena they encounter in their patient-doctor or casebook patients). Moreover, the content and tasks should prepare students for the next step, such as clinical clerkships. One approach would be to move from simple (the physiology related to one symptom) to complex mechanisms (physiological interactions, constellations of symptoms, or disease). Concurrently, discussions would move increasingly toward reasoned differential diagnoses.

- Small group facilitators should be selected for an expressed interest in promoting active learning, and should be trained continuously to promote critical thinking, collaboration and professional behavior within groups.

- The school should construct flexible, multi-purpose space for small group teaching and learning. It should include a conference table, examination table, sink, internet access, ample and flexible smart boards, video cameras, and materials such as books, simulators and models. Each space could be “owned” by pods of students who could access it for self-directed study. It should be understood that research on variations in instructional methods would be on-going in a “continuous quality improvement” approach, with benefit accruing to the students as soon as possible.