

# Measuring Faculty Effort and Contributions in Medical Education

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## ABSTRACT

A national panel on medical education was appointed as a component of the AAMC's Mission-based Management Program and charged with developing a metrics system for measuring medical school faculty effort and contributions to a school's education mission. The panel first defined important variables to be considered in creating such a system: the *education programs* in which medical school faculty participate; the *categories of education work* that may be performed in each program (teaching, development of education products, administration and service, and scholarship in education); and the array of *specific education activities* that faculty could perform in each of these work areas. The panel based the system on a relative value scale, since this approach does not equate

faculty performance solely to the time expended by a faculty member in pursuit of a specific activity. Also, a four-step process to create relative value units (RVUs) for education activities was developed. This process incorporates quantitative and qualitative measures of faculty activity and also can measure and value the distribution of faculty effort relative to a school's education mission. When adapted to the education mission and culture of an individual school, the proposed metrics system can provide critical information that will assist the school's leadership in evaluating and rewarding faculty performance in education and will support a mission-based management strategy in the school.

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Medical school deans and faculties now recognize that changes in the organization, financing, and delivery of health care services have the potential to undermine the financial status and traditional roles of medical schools and teaching hospitals, thereby threatening the viability of their academic missions. In response, leaders of these institutions are striving to establish management

strategies that will allow them to better meet the challenges these changes pose. They recognize that management decisions must be based on more complete and accurate information than is available at present, particularly information about the effort and contributions that faculty make to the individual missions of the medical school. To achieve this goal, deans and faculties must develop policy guidelines and metrics (i.e., measurement) systems that will allow them to measure and reward faculty effort and contributions in education, research, patient care, and service.

To assist deans and faculties in their efforts to transform their management practices, in 1998, the Association of American Medical Colleges embarked on a major new initiative, the Mission-based Management (MBM) Program. As part of this program, the Association established expert panels on medical

education, research, and patient care to provide guidance in how medical school deans and faculties might approach the challenges of establishing guidelines and metrics systems that can serve their new management strategies. In implementing a mission-based management approach that aims in some rational manner to align the resources available to a school with its institutional missions, faculty effort and contributions to a school's education mission must be adequately recognized and accounted for.

As the members of the Medical Education Panel, we wrote this article to present a framework that the dean and faculty of an individual school can use to develop a metrics system for measuring faculty effort and contributions to their school's education mission. We endorse as a fundamental principle that each medical school should establish

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## Overview

This report is the first of three expert panel reports prepared in conjunction with the Mission-based Management (MBM) Program of the Association of American Medical Colleges (AAMC), an initiative described in this article. The panel reports are intended to complement related work of the MBM Program. The other reports and the results of that work will appear in separate documents published by the AAMC in the near future.

This article—the report of the Medical Education Panel—builds on earlier work conducted by individuals at several medical schools who recognized the value of developing metrics systems that would allow them to measure faculty effort and contributions to their schools' education programs. In the article, the Medical Education Panel emphasizes the value of the data derived from a metrics system for counseling and mentoring faculty with respect to their career development, and for rewarding them for their contributions to their schools' education programs.

While the emphasis the panel places on these issues is appropriate, it is important to recognize also that the data derived from a metrics system are useful for constructing a distinct budget for a school's education mission. The development of an education program budget has value for informing management decisions about the allocation of a school's financial resources. This is particularly relevant today because of growing concerns about the long-term financial stability of some medical schools.

It is important to be aware that the value of establishing a distinct education program budget has been recognized for some time, long before there were any concerns about the financial stability of medical schools. In the 1984 GPEP Report, the Panel on the General Professional Education of the Physician and College Preparation for Medicine recommended that each medical school establish a defined budget for the education program. The panel made that recommendation believ-

ing that in the absence of a budget the actual investment in the educational process could not be ascertained, and adapting financial resources to program changes would be difficult.

It is not clear how many schools, if any, have established over the intervening years distinct budgets for their medical students' education programs. In the early 1990s, the AAMC surveyed medical schools to compile information about the ways that the schools had responded to a series of recommendations set forth in the GPEP Report and several other curriculum-reform reports issued during the 1980s. At that time, none of the medical schools that responded to the survey reported that it had established a defined budget for the education of medical students.

We believe that the implications of the lack of an education program budget are more serious today than they were in 1984. Indeed, the Liaison Committee on Medical Education (LCME) seems to share this view. Because of its concerns about the stability of medical school financing, the LCME is in the process of strengthening the existing standard that governs the financing of the education program. In the future, medical schools will be required to demonstrate that their financial resources are adequate to sustain a sound program of medical education. It is difficult to understand how a school will be able to meet this standard if it has not developed a distinct budget for its education program. The report of the Medical Education Expert Panel presents a framework that deans and faculties can employ to respond to this important issue.

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guidelines and a metrics system that are consistent with the particulars of its education mission and how that mission relates to the tradition and culture of the institution. Accordingly, the framework presented in this report should be viewed simply as a tool that can assist deans and faculties to achieve their

goals. In preparing this report, our intent was to provide a metrics system that exceeds what most institutions have adopted, or are planning to adopt, for the evaluation of faculty performance in education, hoping that this approach would allow an individual school to use the report to develop or

expand a metrics system that serves its needs.

After reviewing metrics systems developed by a small number of medical schools, we embraced the view that there are advantages to adopting a system of measurement that employs a "relative value scale" to distinguish

among the various ways that the individual faculty member contributes to a school's mission. Using this approach a value, or weight, is assigned to each of the variables to be measured—in this case, education activities—thereby creating a relative value unit (RVU) for each activity. These values are calculated using formulas (shown later in this article) that take into account such variables as the time and effort involved in each activity, the level of the faculty member's experience and skill, and the importance to the school's mission of each activity. The units are relative to one another when taken in the aggregate to form a relative value scale. An important advantage of this approach is that faculty effort and contributions, whether those of individual faculty members or of groups of faculty, are not equated solely to the time expended in pursuit of a specific activity.

To provide a framework for this approach, List 1 presents a comprehensive review of the specific education activities that faculty might conduct, and classifies these activities into four major categories of education work: teaching; development of educational products; education administration and service; and scholarship in education. The work of faculty members in student admission or student affairs is not included in this document, but some institutions may choose to include those activities. While teaching is the cornerstone of education, the four categories serve to recognize other work in education that is important to students and schools. Placing different types of education activities into work categories also allows a school to consider the relative value of each work category to its education mission. After defining the education activities and their work categories, we set forth steps, described below, that a school might follow in developing a metrics system for education based on a relative-value-scale approach.

## List 1

### A Comprehensive Listing of Specific Medical School Faculty Activities in Education

#### Teaching

1. Lecture activity
  - Lecturing in preclinical, clinical, or graduate course
  - Lecturing during grand rounds
2. Laboratory activity
  - Providing instruction in wet laboratory, computer laboratory, or skills laboratory activities
  - Providing instruction in research laboratory work
3. Small-group activity (non-clinical)
  - Serving as tutor or facilitator in problem-based learning
  - Serving as small-group leader in a course
  - Serving as seminar leader
  - Serving as journal club leader
  - Serving as group leader for research or publication review
4. Individual activity (non-clinical)
  - Serving as individual tutor
  - Serving as advisor or mentor for students and trainees
  - Serving as research preceptor or thesis director
  - Giving assistance with grant or manuscript preparation
5. Clinical activity
  - Performing inpatient teaching during attending rounds
  - Teaching during inpatient consultation rounds
  - Teaching in surgery or special clinical procedure rooms
  - Serving as preceptor for student-housestaff patient care team
  - Serving as outpatient clinic attending
  - Serving as ambulatory care preceptor
  - Serving as case-based session leader on wards or in clinic
  - Serving as clinical conference leader
  - Conducting student or resident morning report
  - Serving as housestaff advisor

#### Development of Education Products

1. Development of education units
  - Developing a major curricular unit (e.g., course, clerkship, or laboratory program)
  - Developing a minor curricular unit (e.g., lab session, problem-based learning case, or conference)
  - Participating in computer-based learning design and development
  - Participating in major revision of course, clerkship, laboratory, or other units
2. Development of education materials
  - Developing innovative teaching methods, learning tools, or distance learning
  - Developing syllabus or manual (e.g., course or laboratory)
  - Developing teaching materials
  - Developing examinations and other evaluation tools
3. Development of personnel
  - Participating in standardized patient orientation and training
  - Developing faculty and staff skills

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**List 1 (Continued)****Education Administration and Service**

1. Direction of education components
  - Serving as program director (e.g., directing graduate or residency program)
  - Serving as course director
  - Serving as clerkship director
  - Serving as laboratory director
  - Serving as elective director (e.g., research, preclinical, clinical)
  - Serving as director of review activities for certification examinations
2. Evaluation of education
  - Evaluating student, resident, or other trainee performance
  - Evaluating and mentoring faculty educators
  - Evaluating major curriculum change
  - Evaluating education programs
3. Administration of education
  - Providing leadership at school level (e.g., education dean)
  - Managing course, clerkship, laboratory, conference, or elective activities
  - Designing and administering training programs, including research training
  - Contributing to facilities development and scheduling
  - Providing education committee service and leadership
4. Special service
  - Serving in outreach programs (e.g., K-12, college, community, and government)

**Scholarship in Education**

1. Research in education
  - Submitting an education grant proposal (internal or external)
  - Receiving an education award (internal or external)
  - Directing education research or scholarly project (internal or external)
  - Collaborating on education scholarship (internal or external)
2. Publications in education
  - Publishing peer-reviewed articles
  - Publishing non-peer-reviewed articles
  - Publishing abstracts
  - Publishing book chapters
  - Authoring a book or books
  - Having publications in other media (e.g., video, CD)
3. Presentation in education
  - Making internal presentations
  - Making external keynote, plenary, or symposium lectures or presentations
  - Making external abstract-based oral or poster presentation
  - Serving as visiting professor
4. Service on editorial boards, review bodies, or in elected positions
  - Serving as book or journal editor
  - Serving as editorial board member or chair
  - Reviewing manuscripts, media, etc.
  - Reviewing grants
  - Serving in elected office in education organizations
  - Providing consultation in education
5. Receiving education awards and prizes (internal and external)

**STEPS TO DEVELOP A RELATIVE-VALUE-SCALE METRICS SYSTEM**

A medical school that decides to adapt for its own purposes the framework described in this report for the measurement of faculty effort and contributions in education should recognize that the design and implementation of a successful system usually will benefit from input by teaching faculty, administrators, and students. A planning committee representative of these constituencies may ensure that the measurement system is feasible and that it will be seen to be of value to the faculty. The approach taken to introducing the system is important, since many members of the faculty may respond negatively if they perceive the system to be only a management tool that will be a burden for them and, perhaps, restrict their activities. The potential value of the system for mentoring, career counseling, and determining performance-based rewards should be clearly articulated and widely discussed.

Conducting a pilot application of the system may detect flaws in design and application before its widespread utilization. Since education activities and objectives may change over time, it is important that a school establish a process for the regular review of the metrics system that has been adopted and establish policies outlining how the system's measures can be recalibrated. A school must decide whether to start with a simple system and through experience add complexity to expand the system's utility, or to start with a complex system and with experience simplify it by retaining only the most useful features. The best approach will depend on the school's objectives and culture.

The steps outlined below were developed to assist medical school deans and faculties that decide to develop a relative-value-scale system for measuring faculty effort and contributions to the school's education mission.

## Step 1: Education Activities

Establish a list of the specific faculty activities in education (see List 1) that are to be considered individually in determining a faculty member's effort and contributions to the school's education mission, and assign a value, or weight, to each these activities. There are at least four factors to consider in assigning a value, or weight, to an activity:

- Consideration must be given to the time required to conduct a "unit" of the activity. Therefore, one must decide what constitutes a "unit" of work in each activity. For example, the unit for a lecture (List 1: Teaching category, Lecture activity) might be a single lecture regardless of its duration. On the other hand, the unit for inpatient teaching attending rounds (List 1: Teaching category, Clinical activity) might be one rounding session, a week of attending rounds, or a month of rounds. The magnitude of the unit obviously will influence the value assigned to the activity.
- Consideration must be given to the time and effort required to prepare for each activity. For example, the time required to prepare a lecture for medical students is generally different than the time required in preparing a grand rounds presentation, even though the two activities may be equal in length. In this context, a "new" activity (e.g., the first delivery of a lecture that was prepared by the faculty member) could be assigned a higher value than that assigned for a repeat presentation of the lecture.
- Consideration must be given to the level of faculty experience and skill required for an activity.
- Finally, a school may decide that some education activities are of more value than others to its education mission. It should be apparent that the assignment of higher weights to activities that are deemed of particular value to a school's education mis-

**Table 1**

Relative Value Units (RVUs) per Hour of Direct Faculty Contact in Selected Education Activities at Seven Schools*		
Education Activity	Average RVU/Hour Across All Schools	RVU/Hour Range Across All Schools
Outpatient preceptor	1.5	0.5–3.0
Education committee service	1.75	1.0–3.0
Teaching with clinical procedures	2.0	2.0
Inpatient attending or consult rounds	2.5	1.0–4.0
Clinical conference or morning report	3.0	1.0–4.0
Individual tutor or advisor	3.0	1.5–4.0
Small-group instructor	3.5	1.0–8.0
Lecture	4.0	2.0–10.0
Course director	4.0	1.0–8.0
Grand rounds	12.0	10.0–20.0

\*Data from seven U.S. medical schools that have developed relative-value-scale methods for evaluating faculty activity in education. The reported RVUs were calculated using factors such as the time and effort required by a single faculty member to perform each activity and the level of the faculty member's experience and skill; quality of performance was not included. The activities themselves were considered to be of equal value. Not all schools assigned an RVU to every education activity listed in the table. See the text for a fuller explanation of how RVUs are calculated and for definitions of the education activities.

sion can be used to motivate faculty to participate in these activities.

The relative value units (RVUs) assigned to some common education activities by seven U.S. medical schools\* that have applied relative value scales to measure their faculties' efforts and contributions in medical education are listed in Table 1. The paucity of this information emphasizes the relatively limited application at this time of relative value measures to evaluate faculty effort across the spectrum of activities that comprise the education mission.

For a specific activity, the number of RVUs credited to a faculty member can be expressed as *activity weight*  $\times$  *units of activity performed*.

\*University of Kentucky College of Medicine, Cornell University Joan and Sanford I. Weill Medical College and Graduate School of Medical Sciences, University of Oklahoma College of Medicine, Mayo Medical School, University of Florida College of Medicine, University of Pittsburgh School of Medicine, and Louisiana State University School of Medicine.

## Step 2: Performance

Consideration should be given to adjusting the basic activity weights described in Step 1 based on two characteristics of the faculty member's performance. In the first case, did the faculty member perform an activity alone, or was it performed with other faculty or education staff? A faculty member's RVU value might be downgraded when the activity is a group teaching effort. On the other hand, for the purpose of encouraging interdisciplinary activity in education, involvement in group performance of certain education activities may be regarded as equal in value to solo performance by a faculty member.

The second characteristic to consider is the quality of a faculty member's performance. Adjusting activity values for quality is a potentially difficult but important challenge. We recommend applying methods that vary with the category of education work. An objective process of evaluation of faculty performance by students, housestaff, and peers

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could be used to evaluate quality in the Teaching category. A simple adjustment could be applied where excellent performance on student, resident, or other trainee evaluation would upgrade the RVU value, satisfactory performance would leave the value unchanged, and unsatisfactory performance would downgrade it. In order also to introduce an element of continuous quality improvement in teaching, the RVU values could be upgraded for faculty members who request peer review from a course or clerkship director, or department chair. The results of peer review subsequently could be used along with students' and trainees' evaluations to further adjust the scores for teaching activities.

The quality of faculty activities in the Development of Education Products and Education Administration and Service categories (see List 1) are probably best evaluated by supervisors, i.e., course or clerkship directors, chairs and section heads, or education deans. An important component of quality that can be assessed by faculty supervisors and used to adjust the RVU value is "good citizenship," i.e., the willingness of faculty to volunteer for education work or to mentor their colleagues and staff.

Finally, quality is inherent in the successful performance of most activities in the Scholarship in Education category, e.g., grant awards, publications and presentations, awards and prizes, requests for consultant services, and appointment to editorial boards and grant review committees.

If these adjustments are to be made for a specific education activity, the number of RVUs credited to a faculty member could be calculated as  $activity\ weight \times solo/group\ adjustment \times quality\ adjustment \times units\ of\ activity\ performed$ .

### Step 3: Categories of Education Work

As noted above, the specific education activities performed by faculty can be

classified into four categories of education work, namely (1) Teaching, (2) Development of Education Products, (3) Education Administration and Service, and (4) Scholarship in Education.

Consideration should be given to whether or not to assign different weights to the categories based on their relative values to a school's education mission. For example, is conducting research in medical education (a subcategory of Scholarship in Education) of equal value to Teaching in the pursuit of a school's education mission? And is Education Administration and Service equal to Development of Education Products regarding the mission? If different weights are assigned to the different education work categories, these category weights must be factored into the calculation of faculty effort and contribution to the education mission.

If this adjustment is to be made, the relative weighting of work categories expands the calculation of education activity RVUs credited to a faculty member to  $activity\ weight \times solo/group\ adjustment \times quality\ adjustment \times category\ weight \times units\ of\ activity\ performed$ .

### Step 4: Program Weight

Medical school faculty may participate in a variety of education programs. These include undergraduate, graduate, and continuing medical education programs; masters, doctoral, and postdoctoral programs in the sciences and other disciplines related to medicine (e.g., public health); and an array of other health professions education programs (e.g., dentistry). Faculty also may participate in health education activities conducted in primary and secondary schools, in undergraduate college courses, and in community-based public education programs. Work in each of the four previously defined categories, and the majority of the specific education activities within those categories, can take place in any of the above-mentioned education programs in which a school's faculty are engaged.

Consideration should be given to whether or not participation in all programs is of equal value to the school's education mission. For example, does participation in the education of allied health professions students have the same value to a school's mission as does participation in the education of medical students? A school may decide that "a learner is a learner" regardless of the program the student is enrolled in and, thus, decide that participation in all programs is of equal value. Alternatively, a school may decide that this is not the case and may assign different weights to various programs, thus creating a relative value scale for education programs. If so, these program weights must be factored into the calculation of faculty effort and contribution to the education mission.

If this adjustment is to be made, the number of RVUs credited to a faculty member would be calculated as  $activity\ weight \times solo/group\ adjustment \times quality\ adjustment \times category\ weight \times program\ weight \times units\ of\ activity\ performed$ . The total number of RVUs credited to a faculty member for effort and contributions to education is the sum of the calculated RVUs for each specific education activity.

It is important to recognize that the primary quantitative measure of faculty effort and contribution in education is the sum of activity-weighted units for each education activity. When modified by step 2 the sum of activity units assesses both the quantity and the quality of faculty activity. When further modified by steps 3 and 4, it measures the distribution of faculty effort and contribution relative to the education mission. In this regard, it should be recognized that most activities in Teaching, Development of Education Product, and Education Administration and Service are assigned to faculty members. Therefore, when the education-performance profile is intended for evaluation of an individual faculty member, category and program weight factors should

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be deleted to avoid the possible penalizing of the faculty member. However, as noted above, category and program weight may be important when individual or composite performance profiles are used to assess the distribution of effort relative to the education mission.

An additional caveat must be considered when designing and using a relative value scale of the type outlined in this report. The system as presented is not designed to accurately measure the total time devoted to education activities by a faculty member. The system, therefore, cannot be used to retroactively evaluate faculty performance against an allocated distribution of effort (i.e., allocated total time expended on education, research, patient care, and institutional service).

#### DATA COLLECTION AND MANAGEMENT

Implementation of a system to comprehensively measure faculty members' efforts and contributions in education using a relative value scale may fail unless an efficient method is employed to collect data for specific faculty activities. The use of paper forms for recording, reporting, and processing detailed activity data for large numbers of faculty, on an annual or semiannual schedule, will not be feasible in most institutions. Instead, such information should be collected and processed using a Web-based system.

Using this approach, course or clerkship secretaries, faculty members, students, and designated others can access a restricted Web site (based in a department or the central administration) that offers a comprehensive menu of activities in education. The type and number of activities performed could be quickly entered along with narrative comments in selected fields. Faculty members could self-report activities, and student or peer evaluations of faculty performances also could be entered. In most cases, course directors, chairs,

or education deans could perform selective data verification and make adjustments, based on quality and other factors, to the calculated RVU values.

The resulting database could be programmed to perform the weighting functions and to produce profiles, either for individuals or for academic departments. In each of the four categories of education work the sum total of RVUs measures a faculty member's contribution in that category. The sum total of RVUs from all four categories, appropriately weighted for their distribution within each program, profiles a faculty member's effort and contributions to a school's education mission. Quantitative activity profiles or quality-adjusted performance profiles can be referenced to expected levels of faculty activity, or to the norms for activity in the faculty member's department or in the school as a whole. As an additional application, the database could be formatted as a teaching portfolio that would be useful to school and department administrators as well as to the faculty member.

A fully developed system for measuring a faculty member's performance would integrate profiles in education, research, clinical activity, and professional community service. At this level, efficiencies could be achieved by creating a composite profile that recognizes the interactions among education, research, and clinical activities. Measures of institutional service, publication and presentation, and recognition acquired for faculty achievements could be integrated across the major faculty activity areas. For example, the publication and presentation of education projects, biomedical research, and clinical observations could be integrated to calculate a comprehensive RVU score for a faculty member's activity in publication and presentation.

#### APPLICATION OF FACULTY PERFORMANCE MEASUREMENTS

A metrics system that characterizes the efforts and contributions of faculty is

but one source of information to inform and guide leadership and management in decision making. Such a system, therefore, should not be substituted for judgment on the part of management. In this context, a school should design a metrics system that will accurately measure the faculty activities of interest and thereby generate the information necessary to support the development of faculty members as well as the education mission. In some cases, a system to measure faculty effort and contributions may best be served by using data collected over periods of time that exceed one or more academic years.

Among the many uses for measures of faculty effort and contributions, a few seem particularly relevant in today's medical school environment. Quantitative and qualitative measurements of education, research, and clinical service are essential for making decisions about a faculty member's reappointment, compensation, or promotion, or the award of tenure. A comprehensive relative value profile of a faculty member's efforts and contributions in education may be of great value, since information about faculty teaching often has been highly subjective and insufficient to permit a comparative analysis of a faculty member's activities in education. The availability of good research and education measures also can support the mentoring and career counseling of faculty, especially at a time when faculties in most schools are conflicted regarding the allocation of their time. A number of schools are introducing performance-based compensation and incentive pay plans for faculty. These systems require measures of faculty members' performances to evaluate the distribution of their efforts and the achievement of productivity goals. It is clear that comparable measures of faculty and departmental productivity, based on effort and contributions and their costs in terms of time and money, will be necessary for the successful application of mission-based management to medical schools.

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For example, measures of faculty productivity in the area of education could provide a rational basis of allocating tuition or state appropriation dollars to academic departments.

In presenting this report, we emphasize that we view the career development of faculty—a medical school's most valuable asset—as a fundamental responsibility, as well as an essential element of a school's management strategy. We believe that the framework set forth in this article provides a valuable approach for developing data that can and should be used for more effective mentoring and counseling of faculty

with respect to their career development as well as for the other purposes outlined earlier.

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