Clinical Teacher Effectiveness in Medicine

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Abstract—Characteristics of best and worst clinical teachers in medicine are described by a random sample of medical school faculty, residents, and third- and fourth-year students at the University of Washington. The responses were factor analyzed and examined to determine whether the ratings were systematically influenced by professional role, faculty department, and teaching method. Best clinical teachers are described as being enthusiastic, clear and well organized, and adept at interacting with students and residents. Worst clinical teachers lack these skills and are characterized by negative personal attributes. Using analysis of variance, the investigator found no significant differences in ratings on the three variables examined. Six of the seven hypothesized dimensions of clinical teaching were confirmed by factor analysis. The results are discussed in relation to faculty development and evaluation of clinical teaching.

Evaluation of faculty teaching effectiveness has become a major concern in higher education as demands have increased for accountability and documentation of teaching excellence for academic promotions and faculty self-improvement purposes. To help meet this demand, numerous standardized student rating forms have been created and widely used. In medical education, evaluation of teaching effectiveness is complicated by the extensive use of clinical instruction. Standardized classroom rating forms are not applicable to clinical teaching because of the unique aspects of clinical instruction, the use of multiple instructors, and the small number of students involved.

Valid and reliable evaluation mechanisms for clinical teaching are needed but currently unavailable. Clear descriptions of effective clinical teacher behavior are also needed so that faculty members can be helped to improve and residents can be better prepared for the teaching functions of academic life.

Past efforts of medical schools to improve and evaluate clinical teaching have been made on the basis of limited empirical research. Few investigators have identified specific teacher behaviors characteristic of best or worst clinical teachers in medicine, and none has determined whether the ratings of these characteristics are influenced by extraneous factors beyond the control of the teacher. Therefore, this study was designed to identify characteristics of best and worst clinical teachers in medicine as perceived by faculty, residents, and students and to determine whether ratings of these characteristics were systematically influenced by professional role (faculty, resident, student), department (medical specialty, surgical specialty), or teaching method.

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(formal inpatient [rounds and clinical supervision], formal ambulatory [clinical supervision], formal didactic [lectures, seminars], and unscheduled informal teaching).

Literature Review

Researchers have identified basic components or dimensions of effective teaching by sorting its individual characteristics into related groups. These dimensions have been determined by subjective examination of questionnaire items and by factor analysis. The number of dimensions of effective teaching reported in studies of postsecondary classroom and clinical instruction range from two to 14, with four to five particular dimensions appearing rather consistently. Dimensions which commonly appear in studies of both classroom and clinical teaching tend to reflect instructor organization, relations with students, enthusiasm, and knowledge. Dimensions found primarily in studies of clinical instructors involve clinical supervision, clinical competence, and modeling of professional standards and values.

Four factors found in the literature to be common to both classroom and clinical teaching are listed first along with illustrative teacher behaviors and references:

1. "Organization/clarity": explains clearly, presents material in an organized manner, summarizes, emphasizes what is important, and communicates what is expected to be learned (1–13).

2. "Group instructional skill": encourages active participation, establishes rapport, demonstrates respect for students, shows personal interest in students, willingly remains accessible, emphasizes problem-solving, listens attentively, answers questions carefully and precisely, and questions students in a nonthreatening manner (1–5, 7–15).

3. "Enthusiasm/stimulation": is enthusiastic, is dynamic and energetic, enjoys teaching, has an interesting style of presentation, and stimulates interest in the subject (1–15).

4. "Knowledge": discusses current developments, reveals broad reading, discusses divergent points of view, relates topics to other disciplines, and directs students to useful literature in the field (1, 2, 4, 7, 8, 11, 13–16).

Three additional factors were identified in the literature as being characteristic of clinical teaching:

5. "Clinical supervision": demonstrates clinical procedures, provides practice opportunities, offers professional support and encouragement, observes student performance frequently, identifies strengths and limitations objectively, provides feedback and positive reinforcement, and corrects students without belittling them (2–3, 7–8, 15–24).

6. "Clinical competence": objectively defines and synthesizes patient problems; demonstrates skill at data-gathering, use of consultations, and interpreting laboratory data; manages clinical emergencies; works effectively with health care team members; and maintains rapport with patients (2, 15, 17–20, 25).

7. "Modeling professional characteristics": is self-critical, takes responsibility, recognizes own limitations, does not appear to be arrogant, shows respect for others, seems to have self-confidence, and demonstrates sensitivity to others (7, 14, 19–20, 23–26).

These dimensions appear to be important aspects of effective clinical teaching and served as the seven hypothesized dimensions in this study.

Method

Researchers studying teaching effectiveness have progressed in three ways by investigating student perceptions, the
teaching process, and learning outcomes. A majority of studies have been addressed to student (and less frequently faculty and administrator) perceptions of teacher performance. Such ratings have generally been found to provide valid and reliable information on the quality of instruction (27). Studies of perceptions have the advantage of yielding information on a wide range of teacher behaviors from a large number of observers at a nominal cost. Limitations can include lack of item validity and failure to recognize that the results represent perceptions of teacher behavior rather than actual teacher performance. However, positive correlations have been found between measures of perceptions (student ratings) and measures of teaching process (trained observer ratings and ratings made from tape recordings of instruction) as well as between selected teacher behaviors and learning outcomes (9).

In this study perceptions of medical school faculty, residents, and students were measured. The inclusion of faculty members and residents in the study expanded prior research in the area. Observations of teaching process and assessment of learning outcomes were beyond the scope of this research.

The study population was University of Washington School of Medicine's full-time academic faculty members with M.D. degrees (N = 308), third- and fourth-year medical students (N = 263), and residents in university-affiliated residency programs (N = 382). The sample consisted of 160 randomly assigned subjects from each group, for a total sample size of 480. Names within each group were randomly assigned to four subgroups which represented the teaching method to be described by the respondent.

Data were collected through a mail survey questionnaire composed of 61 clinical teacher behaviors. The items were viewed as samples of teacher behaviors within the seven dimensions of clinical teaching listed previously. The 61 items were derived from a review of the literature, pilot-testing, and presorting. Items were placed on individual cards and sorted into the seven dimensions by a dozen judges composed of faculty, residents, students, and medical educators. Only those items achieving two-thirds agreement among judges were incorporated into the study.

Under the assumption that it is equally important to know what not to do as well as what to do, respondents were asked to describe the characteristics of best and worst clinical teachers. In Part I of the survey instrument, respondents identified their best clinical teacher for a predetermined type of teaching method; and in Part II they selected their worst clinical teacher for the same teaching method. Faculty members were asked to select a colleague whose teaching they had observed recently and whom they would identify as a best (and for Part II worst) clinical teacher. This was done to ensure equivalent recency of reporting among the three groups. Respondents were then requested to rate how descriptive 61 teacher behaviors were of these individuals. A seven-point scale ranging from "not at all descriptive" to "very descriptive" was utilized, along with columns for "doesn't apply" and "don't know." An open-ended question completed each section: "What were the three to five most important characteristics that made this person stand out in your mind?"

The survey was mailed in June 1976, and follow-up letters were sent out in August and September. A usable response rate of 56 percent (N = 268) was obtained from a total response of 74 percent. A follow-up of randomly selected nonrespondents resulted in interviews with 12 subjects. Results indicated no significant differences among
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respondents and nonrespondents on answers to open-ended questions. Consequently, it was assumed that respondents were representative of the total sample.

Statistical procedures used to analyze the data included: mean scores on items and dimensions; analysis of variance to examine differences in ratings among dimensions, between best and worst clinical teachers, and among three variables (role, department, and method); and factor analysis to confirm the hypothesized dimensions and clusters of teacher behaviors.

Results

The first research objective was to describe teacher behaviors perceived to be characteristic of best and worst clinical teachers in medicine. This was achieved by analyzing respondent ratings of the 61 teacher behaviors and responses to the open-ended questions in each section. Ratings for best and worst clinical teachers were examined separately by item and by dimension. For purposes of clarity, only dimension mean scores for best and worst clinical teachers are reported in Figure 1.

The most descriptive characteristics of best clinical teachers based on highest factor ratings were enthusiasm, clarity and organization of presentation, and clinical competence. Worst clinical teachers were rated much lower on all dimensions. The highest ratings for worst, albeit moderate ones, were obtained on modeling professional characteristics, clinical competence, and knowledge.

The second method of describing the most important characteristics of best and worst clinical teachers was obtained through responses to open-ended questions. The most frequently listed important characteristics for best clinical teachers were a breadth of medical knowledge; enthusiasm; enjoyment of teaching; friendliness; clinical competence; clear and well-organized presentations; accessibility; and interest in students, residents, and patients. The most frequently listed important characteristics of worst clinical teachers were arrogance, appar-

![Figure 1](image-url)

Mean scores for best and worst clinical teachers on seven dimensions of teaching effectiveness ($N = 268$).
ent dislike of teaching, limited knowledge, inaccessibility, lack of self-confidence, unorganized and boring presentations, dogmatism, insensitivity to others, and belittling of students and residents. Thus, the major difference between best and worst clinical teachers appears to be the instructional skills of best (that is, organization and clarity of presentation, enthusiasm, and interaction skills) and personal attributes of worst (that is, arrogance, lack of self-confidence, dogmatism, and insensitivity).

The second research objective was to determine whether ratings of these teacher characteristics were systematically influenced by variables beyond the control of faculty. Any evaluation system designed to assess teaching effectiveness of medical school faculty must be constructed in such a way as to minimize the impact of variations in ratings due to extraneous factors. Three factors which have been found to influence ratings in prior research include professional role of the rater (for example, faculty member, resident, and student), department affiliation of the faculty member (for example, medical specialty and surgical specialty), and teaching method employed (for example, clinical supervision in inpatient and outpatient settings, lecture, and informal teaching).

Variables of role, department, and teaching method served as the independent variables in a three-way analysis of variance with the responses to the items entered as the dependent variable. Part I (best clinical teacher) and Part II (worst clinical teacher) were computed separately. No significant differences were obtained on the three main effects (role, department, teaching method) for best or worst clinical teachers at the .01 level.* Thus, the ratings appear not to be unduly influenced by the variables of role, department, or teaching method.

Three validity questions associated with the study were examined: Do dimension ratings differ from one another? Are ratings on the seven dimensions higher for best than for worst clinical teachers? Can the seven dimensions be empirically confirmed?

On the assumption that teacher performance varies, some teacher behaviors should be more descriptive of best (and worst) clinical teachers than others. Students, residents, and faculty should be able to identify these differences as reflected in the seven dimensions. To test for such differences, analysis of variance was performed. Significant differences across the seven dimensions were found at the .001 level on ratings of best and worst clinical teachers. Such differences across dimensions indicate that respondents were able to make discriminating judgments about the teaching effectiveness of best and worst clinical teachers. Thus, the raters did identify differences among the seven dimensions for best and worst clinical teachers.

The second validity question related to the need to know whether best clinical teachers were rated differently from worst clinical teachers on each dimension. If the items and dimensions in this study are to be used in student rating forms, each dimension should effectively discriminate best from worst clinical teachers. To test for this, mean differences between best and worst clinical teachers were computed on each dimension. These served as the dependent variable in an analysis of variance. All seven dimensions significantly discriminated best from worst clinical teachers at the

* In addition, there were no two-way interaction effects for best or worst and no three-way interaction effects for worst, but there was a significant three-way interaction effect ($p < .01$) for best clinical teachers. This may be of theoretical interest but it has little practical significance.
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.001 level, and the dimensions are, therefore, suitable for use in clinical teacher rating forms.

To determine which of these dimensions most effectively differentiated best from worst clinical teachers, the Newman-Keuls multirange test (28) computed at the .05 level of significance was employed. The seven dimensions were separated into four subsets. The most highly discriminating subset (composed of dimensions having the largest mean score differences between best and worst clinical teachers) included "enthusiasm/stimulation" and "organization/clarity." The second subset consisted of "group instructional skill" and "clinical supervision." This was followed by "clinical competence" and "modeling" and finally by "modeling" and "knowledge." Thus, what separated best from worst clinical teachers most effectively was the instructional skills of the best (that is, enthusiasm, organization and clarity of presentations, and interaction skills).

The third validity question asked whether the seven dimensions could be empirically confirmed. Factor analysis determines the statistical dependencies among a set of variables by examining the way variables correlate and then reducing a large number of variables into a few basic factors. Factor analysis using a principal component solution to orthogonal factors was deemed an appropriate statistical procedure and was employed accordingly.

Six of the seven factors were confirmed, accounting for 49.7 percent of the variance. These included: "group instructional skill" (25.4 percent of variance), "clinical competence" (7.5 percent), "clinical supervision" (5.3 percent), "enthusiasm/stimulation" (4.3 percent), "organization/clarity" (3.7 percent), and "knowledge" (3.6 percent). Modeling was subsumed under the first factor and not found to be orthogonal. The first general factor appears to be a global perception of a clinical teacher's ability to establish rapport and to provide skillful instruction. With the exception of modeling, the results of this factor analysis were consistent with the basic structure of the study and prior research.

Conclusions

Respondents described best clinical teachers as being enthusiastic, clear, and well organized in presenting material and skillful in interactions with students/residents. Worst clinical teachers lacked these skills and were characterized by their personal attributes. This is partially consistent with the Hildebrand and co-workers' report (1) that "Ineffective (university) teachers thus were described by a lack of attributes associated with effective teaching rather than by characteristics associated with poor teaching." Worst clinical teachers in this study were described as lacking the attributes of the best clinical teachers but also manifested a cluster of negative personal attributes.

Similarities between college classroom teaching and clinical teaching are evident. Dimensions of clinical teaching which discriminated best from worst teachers most effectively were common to classroom teaching. Effective teaching involves presenting information clearly and in an organized and enthusiastic manner and interacting with students skillfully.

The contention that teaching, whether classroom or clinical, is multi-dimensional is supported by this research. Seven factors of clinical teacher effectiveness were hypothesized and six factors were confirmed through factor analysis. Clinical teaching is a composite of independent but related skills and personal qualities. Faculty evaluation forms and
instructional improvement efforts should take these into consideration.

For purposes of evaluating teacher effectiveness in the clinical settings of medicine, rating forms can be developed on the basis of factors identified and confirmed in this study. Two such forms have been developed for clinical departments at the University of Washington School of Medicine.

The study also provides a basis for designing improvement strategies for clinical teaching in medicine. Distracting personal qualities of worst clinical teachers are useful to know in order to reduce these behaviors where possible. Instructional skills of best clinical teachers can be taught to faculty members and residents who desire to increase their teaching abilities.

One such improvement strategy is an individualized consultation and self-assessment process in use now at the University of Washington. Upon request of a faculty member or department, an educational consultant observes faculty clinical teaching and provides feedback. Additionally, the faculty member independently completes a Self-Assessment Inventory for Clinical Teaching in Medicine (designed from this study) and reviews it with the consultant. Focusing on highest and lowest ratings, strengths are noted and action plans are designed for meeting specific problem areas. Faculty response to the inventory and consultation has been positive.

References


