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Research Article

The Qualities that Matter - Understanding the Medical Student Perspective of Residents as Teachers

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Abstract

Background: Residents largely contribute to the education and professional growth of students in undergraduate medical education. Residency is a unique teaching environment due to the close interaction of the residents and students in a hands-on setting where both groups must practice medicine while teaching and learning. Several national organizations recognize the importance of the resident teaching role and recommend or require preparation of resident teachers for student teaching. However, literature is sparse in describing the medical student perspective on positive qualities of resident teachers. **Objective:** We aimed to identify the most effective resident teaching behaviors that positively influenced medical student learning in the clinical setting. **Methods:** 160 medical students from a single institution rotating at 15 different Family Medicine residency programs were prompted to evaluate preceptors at their clinical site rotation. Students assessed the teacher using a 5-point Likert scale rating teacher effectiveness, and provided open-ended responses regarding descriptions of the teachers' effective behaviors. Data were qualitatively analyzed using grounded theory for common themes. We additionally evaluated the data for frequency of each theme. **Results:** Qualitative thematic analysis of 230 student responses identified 20 themes and 6 sub-themes. The top five behaviors and characteristics of effective resident teachers included "attitude", "feedback", "facilitated independence", "making time", and "competency." Residents that did not facilitate independence were most commonly cited as ineffective teachers. **Conclusion:** Themes found in our results can be used to aid the preparation of residents and clinicians for future teaching. Residents as teachers curriculum should build around these themes.

Introduction

Residents largely contribute to the education and professional growth of students in undergraduate medical education. Although attending physicians play a critical role in medical education, significant supervision of medical students also comes from residents. General education groups commonly cite approachability, humor, professionalism, and creativity among traits of successful and well-respected teachers [1]. However, literature is sparse in describing the medical student perspective on positive qualities of resident teachers.One Canadian study of students interested in Internal Medicine noted that students found certain resident teaching techniques more useful than others, to include use of clinical examples and repetition of core concepts [2]. Somewhat counterintuitive to educational theory, the same group of students did not view resident feedback as useful to their learning. Additionally, their finding of students' valuing a strong knowledge base was in strong contrast to the findings of a recent similar study in the Family Medicine literature [3]. In the Montacute study, qualitative analysis of 28 students rotating in a Family Medicine residency valued a safe learning environment more strongly than resident knowledge and skills.

Several national organizations recognize the importance of the resident teaching role and recommend or require preparation of resident teachers for student teaching. The Liaison Committee on Medical Education (LCME) requires that residents involved in medical student teaching are familiar with the goals and objectives of students rotating with them [4]. In Family Medicine, the American Academy of Family Physicians recommends that residency programs implement a "Residents as Teachers" curriculum in order to prepare the residents to be effective teachers [5]. Despite this guidance, most faculty development and teacher preparation is aimed at teaching faculty; often, residents receive little to no time in deliberate teacher training or preparation [6].

Given the inconsistent results of previous residents as teachers studies, and given the assumption that residents contribute significantly to medical student learning, we aimed to assess resident teacher qualities across our 15 teaching sites. This study was designed to gather examples of effective resident teaching behaviors in the clinical setting.

Theoretical frameworks

Residency is a unique teaching environment due to the close interaction of the residents and students in a hands-on setting where both groups must practice medicine even while teaching and learning. The use of the theoretical frameworks of social learning theory and student-centered learning provide a lens for the specific ways in which teaching and learning interactions occur within this complex environment. These theories also help us look forward to effective ways in which to extend and understand the environment and relationship between resident and student [7].

Social learning

Both Albert Bandura and Lev Vygotsky examined how social environments influence the learning process. Bandura stated, "Social learning theory approaches the explanation of human behavior in terms of a continuous reciprocal interaction between cognitive, behavioral andenvironmental determinants. Within the process of reciprocal determinism lies the opportunity for people to influence their destiny as well as the limits of self-direction" [8].

He posited that people learn from one another, via observation, imitation, and modeling. Bandura also found that social learning emphasizes the significant effects that human thoughts and experience can have on behavior which can be markedly influenced by observation as well as by direct experience [8].

Vygotsky also suggested that learning takes place through interactions with other learners and teachers, as well as other experts. He recognized that learning always occurs in and cannot be separated from a social context, giving prominence to the social contribution(s) to the process of learning development [9-10].

Student-centered teaching/learning

Student-centered teaching/learning is a way to apply the insights of Bandura and Vygotsky, as well as educator John Dewey and psychologist Carl Rogers, to help structure learning experiences [9,11-13]. It emphasizes the need for teachers to create learning experiences that take into account the individual student's' current knowledge and provide the students with the tools and information they need to build the desired future knowledge. Student-centered learning experiences can help motivate and engage students while also preparing them to become self-directed learners. The instructor must draw upon his or her own knowledge and expertise while interacting with students in order to identify gaps in the student's knowledge and arrange appropriate learning activities to help the learner address those gaps. Because clerkships provide such a wide variety of learning experiences, and are also very dependent on which patients are available when students are in the clinic, such an approach can be helpful in that it allows the instructor to focus on structuring the learning environment rather than programming specific content.

These theories help us to understand how students learn in social contexts and inform us about how to construct active learning experiences in the context of wider communities, drawing on the full strength of all members of that group ranging from the senior attending to the resident. They emphasize the needs of the individual learner as a foundation for the structure of learning experiences, and also support the significance of considering the learner's perspective on the qualities of the effective instructors.

Methods

This was an educational retrospective qualitative analysis study. This study was determined to be exempt by the institutional IRB.

In 2016, Family Medicine clerkship students at Uniformed Services University were prompted to provide feedback on preceptors at their clinical site rotation. Students electively completed a short google form on residents or faculty preceptors with whom they directly worked. The first question prompt was tied to a 5-point Likert scale (1=Not effective at all; 5=Extremely effective) "How effective was this staff or resident in facilitating your growth on the Family Medicine clerkship?" This was followed by a second prompt: "Please provide a specific example of this teacher's behaviors that make him/her effective, OR provide an example of a teaching behavior that this teacher could improve upon."

Student responses were collected via google form in an anonymous fashion. This data was downloaded into an excel document for analysis after date and name identifiers were removed. Data were qualitatively analyzed using grounded theory for common themes. Following the initial and independent open coding by the four authors, axial coding revealed 20 themes representing specific skills or characteristics of the resident teacher. We evaluated the data for frequency of each theme.

Results

243 responses were recorded from 160 medical students. 13 responses were excluded from analysis for lack of written responses or due to duplication, resulting in 230 analyzed responses. Qualitative thematic analysis resulted in 20 characteristics and skills identified. The definitions of these characteristics and skills are described in Table 1.

Characteristic/Skill	Definition
Attitude	Student identified the resident's attitude toward teaching as positive
Asks Questions	Student identified resident's "pimping" as a positive learning tool
Advocates For Student	Student noted that the resident advocated for the student in some way (i.e. for involvement in residency activities or to further their education in the program)
Invites/Answers Questions	Student identified the resident as inviting and answering clinical questions posed by the student
Makes Time	Student noted that the resident made time to teach the student
Follows Up	Student identified that the resident followed up with the student regarding understanding of taught concepts
Sets Expectations	Student stated that the resident set clear expectations for their work together
Direct Observation	Student reported that the resident directly observed the student interact with patients
Flexibility	Student identified that the resident was able to adapt teaching to different patients, clinical scenarios,

	and time constraints
Teach Procedural Skills	Student reported that the resident taught procedural skills
Feedback	Student commented that the resident provided feedback
Feedback-Constructive	Student commented that the feedback provided was actionable/constructive
Feedback-Reinforcing	Student commented that the feedback provided reinforcement of positive actions on the part of the student
Feedback-Timely	Student commented that the feedback was provided in a timely fashion
Incorporation	Student felt that the resident incorporated the student in clinical or ward duties
Professional Development	Student noted that the resident provided professional development advice or mentorship regarding future career
Competency	Student noted that the resident was competent in some aspect of their clinical care
Competency-Knowledge	Student commented that the resident knew the material very well
Competency-Communication	Student commented that the resident had effective communication with patients
Competency-Time Management	Student commented that the resident was effectively able to manage the time constraints of clinical, administrative, and teaching duties
Challenges Student	Student noted that they felt appropriately challenged by the resident
Facilitated Independence	Student reported that the resident facilitated their independence as a clinician
Provides Resources	Student noted that the resident provided useful educational or clinical resources
Individualized Education	Student reported that the resident individualized their education to the student's knowledge level and/or interests
Prepares for Learning	Student noted that the resident adequately prepared the student for future learning (i.e. suggesting that the student read about a subject the attending would likely as the student about).
Role Model	Student commented that they would like to somehow emulate the resident in their future practice

Table 1: Identified characteristics and skills defined.

The percent of responses highlighting these characteristics and skills is shown in Figure 1. Notably the top five skills and characteristics identified included "attitude", "feedback", "facilitated independence", "making time", and "competency". Examples of student responses for these five characteristics and skills are shown in Table 2.

Skill/Characteristic	**Example**
Attitude	● "seemed truly invested in my learning" ● "incredibly invested in my education and exposure, making sure I maximize procedures and interesting or beneficial patients" ● "invested time in taking care of the patient, educating us, and ensuring we understood all that was going on in the patient and why certain treatments were tailored to certain patients"
Feedback	● "always had critiques on how to improve and be a better medical student and physician, but he was quick to point out the strengths he saw in me" ● "very direct and timely with feedback, always objective and never berating" ● "provided constructive criticism him after patient presentations that I found helpful and encouraging"
Facilitated Independence	● "allowed students to take ownership of their patients" ● "allowed me to see patients on my own and encouraged me to come up with solid plans for my patients" ● "allowed med students to take responsibility while coaching them through areas that were more difficult"
Makes Time	● "made a point to put time aside for med student learning" ● "provided ample time for discussion of patient's problems and appropriate plans" ● "would go out of her way to help us with morning report presentations and teaching us"
Competency	● "one of the best closed-loop communicators I've had the pleasure to work with and I could see that her patients never left without a very clear understanding of next steps" ● "is a great example of how to create a therapeutic relationship with patients" ● "Not only is he efficient, timely, and organized, but he seems to care an extraordinary amount about quality patient care and his relationships with his patients"

Table 2: Response examples for top five characteristics/skills.

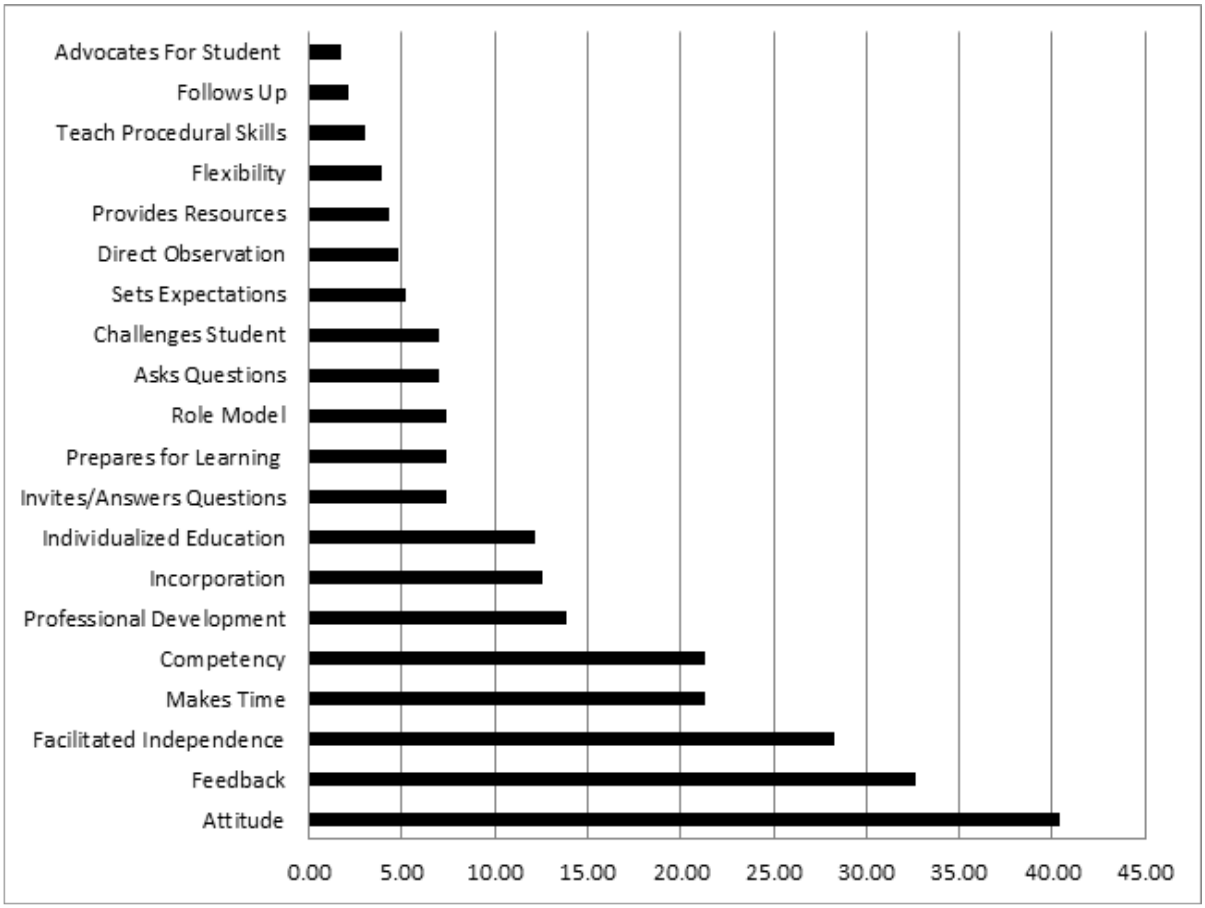

Figure 1: Percent of total responses with identified skills and/or characteristics. 20 identified skills and characteristics sorted by percent of responses containing these skills and/or characteristics.

Analysis of the feedback skill and competency characteristic revealed 3 sub-skills and sub-characteristics, respectively. The frequency of these feedback sub-skills and competency sub-characteristics are shown in Figures 2 and 3. "Feedback-constructive" was the most common feedback sub-skill and "competency-communication" was the most common competency sub-characteristic.

A subset of responses was deemed to be negative, indicating that the medical student thought the resident needed improvement in the skill or characteristic identified. A total of 561 individual data points were collected and of those 6.5% (39) were deemed "negative". The most common negative characteristic was "facilitated independence" as is seen in Figure 4.

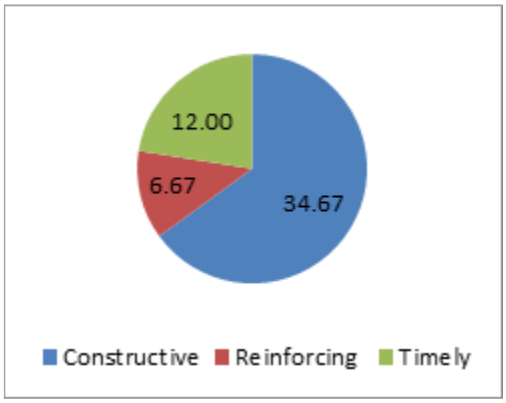

Figure 2: Feedback sub-skills. Breakdown of "feedback" responses based on identified sub-categories.

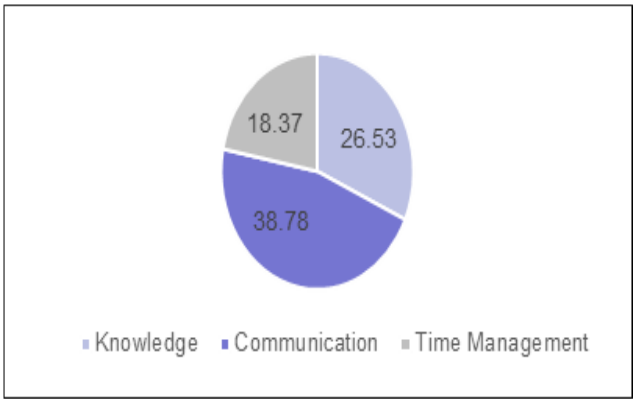

Figure 3: Competency sub-characteristics. Breakdown of "Competency" responses based on identified sub-categories.

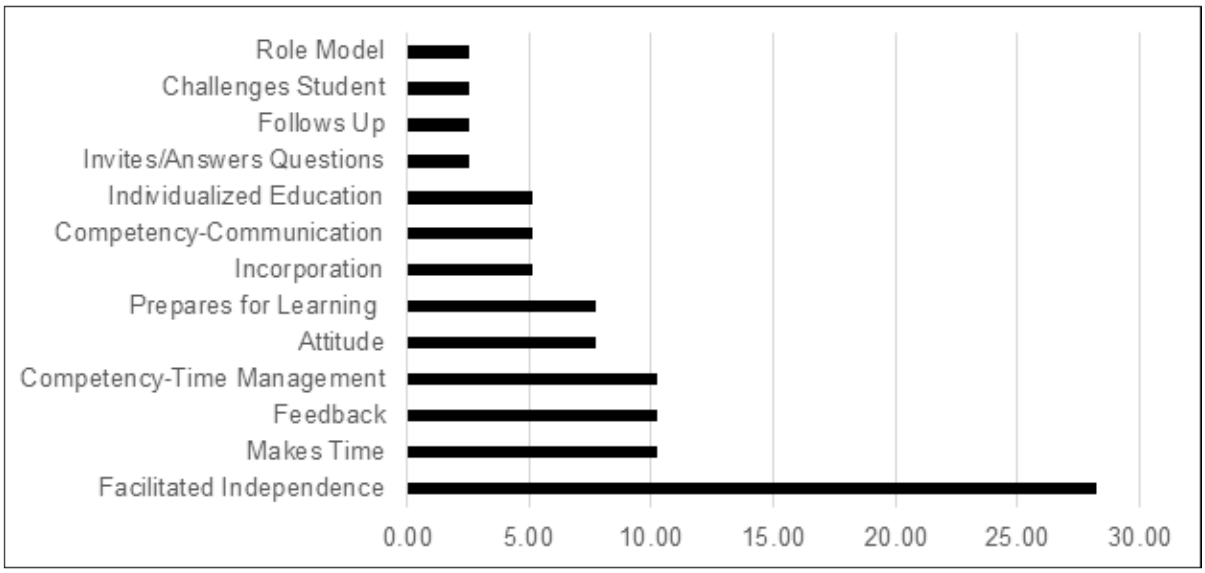

Figure 4: Skills/characteristics identified in subset of responses from figure 1 that suggested a need for improvement. Percent of "negative" responses with identified skills/characteristics.

Discussion

This study aimed to identify characteristics of good resident teachers by examining the perspective of the medical student learner. Our findings contribute to the growing literature about how residents can be effective as teachers, and two educational theoretical frameworks, that underlie the study, social learning and student-centered teaching/learning, both provide a rationale for the results and also suggest next steps for helping to improve the effectiveness of resident teachers.

Among the five most frequently cited characteristics and skills, two that emerged are intrinsic attributes of the teacher, and three are teacher behaviors. The two different attributes identified by students that made their resident teachers more effective, "attitude" and "competency", contribute to social learning by ensuring that the students recognize that the residents have something to teach them and also contribute to the student engagement that can make social learning successful.The three behaviors (providing feedback, making time for students, and providing opportunities for facilitated independence) all call attention to the needs of the students, suggesting that a learner-centered approach is appropriate for residents as teachers. Such students appreciate that they can greatly benefit when resident teachers focus on them and structure learning experiences appropriately for them. When we sub-analyzed comments that referred to residents providing feedback to learners, students most commonly positively commented on the residents' ability to provide critical feedback as an effective teaching strategy. Critical feedback seemed to be valued more than positive reinforcing or timely feedback, which underlines the importance of focusing on the learning gaps of the students when structuring their learning experiences.

While student-centered learning focuses on the role modeling, rehearsal and attending to observed behaviors between student and teacher, it is important to note that social learning theory emphasizes that the learning can also be embedded in and should not be separated from the interactions with, and observations of, others [8-10]. In addition to one on one learning that occurs at a clinical sites (where skills and reproduction of skills are assessed) many students witness other activities and interactions where they themselves are not the primary student engaged in the activity. Residents must be attentive to the fact that learning occurs during all phases of the educational experience including this extended social context. Providing learning opportunities and feedback in social contexts allows learners to benefit not only from the direct one on one engagement with a resident but also from interactions of others, and provides a learning experience for those viewing the interactions but not actively engaged in the conversation or process. Encouraging residents to view their interactions beyond just primary student but to the group at large which can increase the impact for the interactions and can deepen the overall learning experience for everyone.

Results from this study can be used in tandem with other similar studies to inform curricula for preparing residents for their teaching role. Developing an awareness of the extent to which learners value specific attributes in residents can provide motivation to future resident teachers. More importantly, curricula should focus resident skill development on those behaviors documented to be most effective for student learners. Given the need for medical students to enhance their skills through practice in the clinical environment, and their desire for facilitated independence, one teaching technique for residents that should be incorporated into such curricula is scaffolding. Residents who have not received training on instructional techniques may rely on the supposition that working in a clinical environment will automatically stimulate learning and will provide an opportunity to strengthen existing knowledge, bridge a gap or

provide an opportunity to build new knowledge. However, unstructured learning experiences may not help students develop optimally. In order to be purposeful in the development of learner's skills residents must consider structured learning environments. Scaffolding learners entails structuring learning environments systematically to provide the support the learners need early on while gradually reducing the support as they develop their skills. Scaffolding can be achieved by moving through simple to complex modeling or practice of tasks and procedures. The use of scaffolding can enhance learning and aid in mastery, especially for learners who are learning to practice complex skills independently.

Strengths and limitations exist in our study. One strength in our data set analysis is that it spans 160 students rotating across 15 different military treatment facilities. This may offer more power in analysis when compared to the previously published literature. On the other hand, our study is only a representative example of the entirety of the learner-resident teacher encounters over the course of an academic year. This inherently includes a positive teacher bias. Additionally, our study did not evaluate for student outcomes. Future studies should investigate resident teaching behaviors or attitudes that lead to improved student outcomes.

Conclusion

Ultimately, our students defined great resident teachers from the perspective of students as those who approached the clinical learning encounter with a positive attitude and interest in teaching, provided either positive or negative feedback to the student learner, and who facilitated the growth of the student in the direction of an independent practitioner. Themes found in our results can be used to aid the preparation of residents and clinicians for future teaching. Residents as teachers curriculum should build around these themes.

Disclosure

No relevant financial affiliations.

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