

Measuring teacher identity during the transition from medical school to residency

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ABSTRACT

Residents undergo professional identity formation during training, and the integration of a teacher identity into that of a clinician is part of this process. We aimed to measure the teacher identity of incoming interns of various specialties. In this cross-sectional, survey-based study, we modified a validated teacher identity scale and distributed it to residents attending orientation at a large, academic institution. A total of 297 residents took the survey, including 272 interns; 80% (218/272) of interns completed the survey and permitted use of their data. The mean score for global teacher identity was 4.16 (SD 0.67) on a 1 to 5 Likert scale. There were significant differences between interns' current self-assessed teaching abilities and their desired future performance as teachers ($P < 0.001$ for all domains). Male interns had higher global teacher identity scores (4.27) than female interns (4.05; $P = 0.02$). There were no differences in global teacher identity between interns in medical, surgical, and supportive specialties. Interns who had participated in a student-as-teacher program in medical school had higher global teacher identity ($P < 0.001$) than those who had not. In conclusion, teacher identity is high in incoming interns, with higher scores in men and in those who completed student-as-teacher programs in medical school.

KEYWORDS GME; medical education; professional identity formation; resident as teacher; student as teacher

Physician professional identity formation has key implications for medical education, and the integration of a teacher identity into that of a clinician is an important part of this process.^{1–6} During residency, trainee doctors teach students and each other, and programs and accreditation organizations recognize teaching as a core competency for residents.^{7–11} However, there has been minimal research on teacher identity formation in residents. Specifically, no studies have explored when residents begin to recognize themselves as medical educators, though understanding when trainees begin to identify as teachers may provide valuable information to guide the development of teacher-training curricula. In this cross-sectional, survey-based study, we aimed to measure the teacher identity of incoming first-year graduate medical education (GME) trainees (hereafter called interns) of various specialties before they began residency at a large academic institution.

METHODS

We adapted a previously published teacher identity scale validated in primary care preceptors.¹² The 37-item questionnaire measures the constructs of global teacher identity, seven teacher identity subscales, and future desired outcomes as a teacher. We modified wording minimally to make questions applicable to GME trainees and added demographic questions regarding specialty and prior experience with student-as-teacher programs. (See Supplemental Material for complete survey.) We reviewed the questions for clarity with 30 residents using a think-aloud process. A survey expert at our institution also reviewed the modified questionnaire for content validity and accuracy. We paired all questions with a Likert response scale from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree.”

We distributed the teacher identity scale to all incoming residents at a required residents-as-teachers workshop that took place during GME orientation in June 2018 at Baylor

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Table 1. Descriptive statistics of the teacher identity scale results in intern respondents

	Cronbach's alpha	Mean	SD
Overall teacher identity scale	0.94		
Global teacher identity	0.86	4.16	0.67
I see myself as a teacher.		4.27	0.75
I would miss teaching if I stopped doing it.		4.05	0.88
I truly enjoy the role of teacher.		4.29	0.71
I have looked for opportunities to teach.		4.06	0.87
Subscale 1: Feeling intrinsic satisfaction from teaching	0.80	4.37	0.50
Working with learners (i.e., students, interns, residents) has its costs, but it's worth it.		4.26	0.68
I find satisfaction watching my learners' progress.		4.53	0.55
Teaching makes my job more rewarding.		4.37	0.62
It is important to me to work in a teaching environment.		4.33	0.69
Subscale 2: Having knowledge and skill about teaching	0.60	3.62	0.55
I feel skilled as a teacher of learners.		3.54	0.88
It is important to develop my teaching skills.		4.56	0.54
Learners regard me as an effective teacher.		3.73	0.66
I read journals about medical education (e.g., <i>Academic Medicine</i>).		2.65	1.08
Subscale 3: Belonging to a group of teachers	0.76	3.55	0.66
I frequently talk to colleagues about teaching.		3.01	1.02
I feel part of a community of teachers.		3.35	0.98
It is helpful to be able to discuss the progress of learners with colleagues.		3.91	0.70
I enjoy sharing ideas about teaching.		3.92	0.75
Subscale 4: Believing that being a doctor means being a teacher	0.58	4.17	0.44
I do a good job teaching patients about their health.		3.98	0.61
I use similar skills to teach patients and learners.		3.67	0.86
I enjoy teaching patients.		4.31	0.66
Teaching patients is essential to being a good doctor.		4.69	0.54
Subscale 5: Feeling responsibility to teach	0.81	4.26	0.55
All physicians have an obligation to teach the next generation of doctors.		4.28	0.82
I consider teaching to be a personal responsibility.		4.16	0.72
It is important to contribute to medical education.		4.28	0.64
I find it satisfying to think I am contributing to the profession by teaching.		4.31	0.60
Subscale 6: Sharing clinical experience	0.67	3.91	0.54
Residents give learners an important perspective on medicine.		4.42	0.54
I am good at teaching learners to form relationships with patients.		3.63	0.76
I teach the importance of developing long-term relationships with patients.		3.68	0.89
I am a role model for learners who want to work in my specialty.		3.83	0.75
Subscale 7: Receiving awards for teaching	0.79	3.74	0.65
The medical school rewards my teaching (e.g., teaching awards, teaching society membership, etc.).		3.46	0.87

(Continued on next page)

Table 1. Continued

	Cronbach's alpha	Mean	SD
Teaching has contributed to my career advancement.		3.80	0.87
It is important that the medical school and residency program recognize my teaching in some way.		3.84	0.80
I enjoy the recognition I get as a teacher.		3.80	0.73
Future desired outcomes as a teacher	0.8	4.32	0.49
I would like to be a more skillful teacher.		4.56	0.53
I would like to be part of a community of teachers.		4.31	0.68
I would like to be a better teacher for my patients.		4.61	0.52
I would like to spend more time teaching learners about my specialty.		4.28	0.68
I would like to be rewarded for my teaching.		3.87	0.87

College of Medicine in Houston, Texas. We permitted respondents to opt out of being included in the study. We used institutional numbers to identify respondents' genders and ages and then removed the identification numbers from the data set.

We analyzed the data using parametric and nonparametric methods. However, because of similar results using both methods, we report parametric methods results. We used a paired sample *t* test to determine differences between current state of interns' self-assessed teaching abilities and future desired outcomes as a teacher. We conducted an independent-samples *t* test to compare interns who participated in a student-as-teacher program and those who did not with respect to global teacher identity, the survey's seven teacher identity subscales, and future desired outcomes as a teacher. We used one-way analysis of variance to compare the above listed outcome measures among respondents from different medical specialties. As a measure of internal reliability, we examined Cronbach's alpha for the questionnaire as a whole and for each subscale. Data were analyzed using SAS software, Version 9.4 (SAS Institute Inc., Cary, NC). We considered two-sided *P* values ≤ 0.05 statistically significant. The institutional review board at our institution approved the study.

RESULTS

A total of 297 incoming residents completed the survey, of whom 272 were interns; 80% (218/272) of incoming interns took the survey and permitted use of their data. We excluded observations with missing values from the analysis for that subscale, but these missing values were minimal (2% of the total data set).

The median respondent age was 27 years (range 22–35), and 51.4% (112) of respondents were women. Based on previously published classifications,¹³ we divided the interns into specialties: 61.5% (134) were from medical specialties

(dermatology, emergency medicine, family medicine, internal medicine, medicine-pediatrics, neurology, pediatrics, physical medicine & rehabilitation, and psychiatry), 25.7% (56) from surgical specialties (general surgery, neurosurgery, obstetrics & gynecology, ophthalmology, orthopedics, otorhinolaryngology, plastic surgery, urology), and 12.8% (28) from supportive specialties (anesthesiology, pathology, radiation oncology, radiology). Almost half (44.5%, *n* = 97) of the respondents had participated in a student-as-teacher program in medical school.

The mean score for global teacher identity was 4.16, with a standard deviation (SD) of 0.67. Means for the teacher identity subscales ranged from 3.55 (SD 0.66) for *belonging to a group of teachers* (subscale 3) to 4.37 (SD 0.5) for *feeling intrinsic satisfaction from teaching* (subscale 1). The mean score for *future desired outcomes as a teacher* was 4.32 (SD 0.49). Individual item means ranged from 2.65 for *I read journals about medical education* (e.g., *Academic Medicine*) to 4.69 for *teaching patients is essential to being a good doctor*. Cronbach's alpha for the overall survey was 0.94 (Table 1).

Using a paired *t* test, we compared respondents' scores on items asking about the current state of their teaching abilities (e.g., *I feel part of a community of teachers*) with items asking them about the future desired outcomes in that domain (e.g., *I would like to be a part of a community of teachers*). This comparison showed significant differences in the means of the interns' self-perceived teaching abilities and their future desired outcomes as a teacher (Table 2). The largest difference was between *I feel skilled as a teacher of learners* and *I would like to be a more skillful teacher* ($t = -14.4$; $P < 0.001$).

Men scored higher (4.27) than women (4.05) on global teacher identity ($t = -2.46$; $P = 0.02$), but there were no gender differences in any of the subscales or future desired outcomes as a teacher. There were no differences by specialty in global teacher identity, future desired outcomes as a teacher, or six of the seven subscales (Table 3).

Table 2. Differences between interns' current self-assessed state of teaching ability and desired future outcomes as teachers

Current self-assessed state of teaching ability	Mean (SD)	Desired future outcomes as a teacher	Mean (SD)	<i>t</i> ^a	<i>P</i>
I feel skilled as a teacher of learners.	3.54 (0.88)	I would like to be a more skillful teacher.	4.56 (0.53)	-14.4	<0.001
I feel part of a community of teachers.	3.35 (0.98)	I would like to be a part of a community of teachers.	4.31 (0.68)	-13.7	<0.001
I do a good job teaching patients about their health.	3.98 (0.61)	I would like to be a better teacher for my patients.	4.61 (0.52)	-13.4	<0.001
The medical school rewards my teaching	3.46 (0.87)	I would like to be rewarded for my teaching.	3.87 (0.87)	-5.1	<0.001

^aUsing paired *t* test.

Table 3. Comparison of teacher identity scale results for interns in medical, surgical, and supportive specialties

	Mean (SD)			<i>F</i> ^a	<i>P</i> value
	Medicine (n = 134)	Surgery (n = 56)	Supportive (n = 28)		
Global teacher identity	4.20 (0.63)	4.20 (0.76)	3.88 (0.60)	2.69	0.07
Subscale 1: Feeling intrinsic satisfaction from teaching	4.41 (0.52)	4.40 (0.49)	4.15 (0.43)	3.17	0.04
Subscale 2: Having knowledge and skill about teaching	3.62 (0.56)	3.72 (0.48)	3.47 (0.60)	1.98	0.14
Subscale 3: Belonging to a group of teachers	3.59 (0.65)	3.54 (0.68)	3.38 (0.63)	1.26	0.29
Subscale 4: Believing that being a doctor means being a teacher	4.19 (0.43)	4.17 (0.45)	4.06 (0.50)	0.96	0.39
Subscale 5: Feeling responsibility to teach	4.24 (0.56)	4.36 (0.51)	4.15 (0.58)	1.51	0.22
Subscale 6: Sharing clinical expertise	3.93 (0.53)	3.92 (0.53)	3.76 (0.60)	1.29	0.23
Subscale 7: Receiving rewards for teaching	3.70 (0.64)	3.83 (0.69)	3.71 (0.63)	0.74	0.48
Future desired outcomes as a teacher	4.36 (0.47)	4.29 (0.51)	4.22 (0.55)	1.14	0.32

^aUsing one-way analysis of variance.

Residents who participated in student-as-teacher programs in medical school rated significantly higher on global teacher identity ($P < 0.001$) and in six of the seven subscales compared to peers who did not participate in a student-as-teacher program (Table 4). Participation in student-as-teacher programs was not associated with differences in future desired outcomes as a teacher.

DISCUSSION

In our study, we found high teacher identity scores in incoming interns using a previously validated teacher identity scale. Prior studies suggest that faculty develop their identities as doctors or researchers before identifying as teachers,^{5,6} but our results suggest that teacher identity also develops early—even while in medical school. In comparing interns' current self-assessed teaching abilities and desired future outcomes as a teacher, we also found that new interns wish to improve as teachers. A growth-oriented mindset at the beginning of postgraduate training underscores the value

of resident-as-teacher programming and may argue for its initiation early in residency.

Male interns had significantly higher global teacher identity scores than female interns, although there were no significant differences in subscale scores or future desired outcomes as a teacher between men and women. Given that both genders had high teacher identity scores overall, the statistical difference we identified may not signify real-world differences in male and female interns' teaching identities. However, imposter syndrome, a state of self-doubt and fear that prevents self-acknowledgment of true levels of skill and accomplishment, pervades women trainees' experiences in the clinical arena^{14–16} and may do so in the teaching realm as well. As such, residents of both genders may benefit from acknowledgment of the challenges of teaching as a trainee, as well as from a diversity of mentorship and role models.

Between medical, surgical, and supportive specialty trainees, there were no differences in global teacher identity, future desired outcomes as a teacher, or six of seven subscales. In a previously published inventory of tasks

Table 4. Comparison of teacher identity scale results for interns based on completion of a student-as-teacher program

	Participated in student-as-teacher program in medical school: Mean (SD)		<i>t</i>	<i>P</i> ^a
	Yes (n = 97)	No		
Global teacher identity	4.42 (0.53)	3.94 (0.70)	-5.76	<0.001
Subscale 1: Feeling intrinsic satisfaction from teaching	4.51 (0.46)	4.26 (0.51)	-3.70	<0.001
Subscale 2: Having knowledge and skill about teaching	3.81 (0.55)	3.47 (0.49)	-4.75	<0.001
Subscale 3: Belonging to a group of teachers	3.75 (0.68)	3.39 (0.60)	-4.15	<0.001
Subscale 4: Believing that being a doctor means being a teacher	4.19 (0.45)	4.15 (0.44)	-0.77	0.44
Subscale 5: Feeling responsibility to teach	4.39 (0.52)	4.16 (0.55)	-3.19	0.002
Subscale 6: Sharing clinical expertise	4.00 (0.59)	3.84 (0.49)	-2.23	0.03
Subscale 7: Receiving rewards for teaching	3.93 (0.60)	3.58 (0.65)	-3.99	<0.001
Future desired outcomes for teaching	4.38 (0.46)	4.28 (0.51)	-1.48	0.14

^aUsing independent two-sample *t* test.

performed in different medical specialty categories, there were differences in teaching rates among the medical, surgical, and supportive specialties.¹³ However, little is known about differences in teacher identity among physicians in different medical specialties. Longitudinal tracking of trainees in different specialties could assess this area more in the future.

Participation in student-as-teacher programs correlated with higher global teacher identity and higher scores on six of seven subscales. This association is likely influenced by significant selection bias as much as the student-as-teacher programs themselves. However, prior scholarship suggests a positive impact of student-as-teacher programs on medical student teacher identity.^{17,18} Most medical students want formal instruction in teaching, and student-as-teacher programs have developed over the last decade to prepare students for future teaching roles, enhance patient communication skills, and optimize individual learning habits.^{19,20}

Our study had several limitations. The sample was taken from a single GME program at a large urban institution, which limits its generalizability; in particular, the academic setting of our program may have attracted trainees interested in future teaching careers. We used a survey that was previously validated to measure teacher identity in attending preceptors, which may reduce the validity of our findings in a group of trainees. Finally, our one-time cross-sectional use of this survey measures teacher identity in incoming interns, but not teaching ability or teacher identity evolution.

In future studies of the teacher identity scale in residents, we propose expanding the breadth of respondents and represented institutions to validate the survey tool further in a trainee population. We also suggest using the teacher identity scale longitudinally to track how teacher identity evolves with increased clinical exposure and teaching experiences throughout residency training. Further study is also needed

to identify the predictors of global teacher identity, especially to better understand the impact of gender, residency specialty, and prior teacher training.

In conclusion, this study indicates high teacher identity scores in incoming interns of different specialties, with significant differences between interns' current self-assessed teaching abilities and future desire outcomes as teachers. Higher teacher identity scores also correlated with male sex and participation in student-as-teacher curricula.

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