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Teaching Residents to Teach: Do Program Directors and Trainees Agree on Format and Content?

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Abstract

Background: The purpose of this study was to identify the optimal content and format of a resident teaching-skills training curriculum and compare the perspective of residency program directors (PD), medical students (MS) and residents (R).

Methods: This needs assessment was an observational study with a cross-sectional design. Online or printed questionnaires were used to assess the preferred format and content for this curriculum among PD, residents from most postgraduate medical training programs, and MS from Faculté de médecine de l'Université Laval (Quebec City, Canada).

Results: The questionnaires were completed by 26 PD (response rate 72.2%), 146 residents (response rate 21.9%) and 154 MS (response rate 15.7%). Among the list of potential subjects that could be included in the curriculum, *Learning styles*, *Working with students in difficulty* and *Self-directed learning* were scored high by both residents and PD. MS favored *Learning styles*, *Teaching in the ambulatory care setting*, *Teaching health promotion and prevention*, *Teaching with time constraints* and *Direct supervision strategies*. PD also favored *Teaching conflict management* and *Teaching professionalism*, however these were both among the residents' lower scores.

Conclusion: The PD and MS perception of the optimal format and content for residents' teaching-skills training showed some discrepancies when compared with residents' preferences. Since PD are largely involved in curriculum development for their respective specialties and since MS are also well positioned to assess residents' teaching performance, we suggest that PD, residents and MS should all be consulted locally before organizing any intervention for teaching curricula.

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Introduction

Besides their own clinical training, residents are often involved in teaching at the pre-clerkship, clerkship or junior residency levels. The *CanMEDS core competencies* state that residents should be scholars, "(…) able to facilitate the learning of patients, families, students, residents, other health professionals, the public, and others, as appropriate, and to contribute to the creation, dissemination, application, and translation of new medical knowledge and practices".[1] According to the '*practice-based learning and improvement' Accreditation Council for Graduate Medical Education (ACGME) core competency*, "residents/fellows are expected to develop skills and habits to be able to participate in the education of patients, families, students, residents and other health professionals, as documented by evaluations of a resident's teaching abilities by faculty and/or learners".[2] Moreover, the *Liaison Committee on Medical Education (LCME)'s Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree* states that "residents who supervise or teach medical students, as well as graduate students and postdoctoral fellows in the biomedical sciences who serve as teachers or teaching assistants, must be familiar with the educational objectives of the course or clerkship and be prepared for their roles in teaching and evaluation".[3] As prescribed by these organizations, teaching is not only a possibility, but also a responsibility for physicians in training.

In 2002 Busari et al. published a large cross-sectional study where residents considered teaching medical students to be one of their primary responsibilities and where they reported themselves learning in the process of teaching.[4] Similarly, other studies have found that teaching seems to enhance residents' own knowledge acquisition.[5] Most student learners feel that resident teachers facilitate their learning and that residents understand better how they should be taught as they are closest to their training level.[6]

However, some barriers exist for residents in teaching. As they are in training themselves, they must find an appropriate balance between teaching and patient care. In addition, they must deal with a certain lack of confidence in their own clinical knowledge, in addition to feeling a need for teaching-skills training.[4,6,7]

In 2000, a survey conducted in the United States showed that 55% of residency programs offered teaching-skills training to their residents (average curricula duration: 11.5h)[8] compared with 20% in 1993 (average curricula duration: 9h).[9] In 2009, we published a systematic review of formats, contents and impacts of existing teaching-skills training programs for family medicine residents.[10] In general, residents' appreciation of the curriculum was high, as were the evaluations of their learning outcomes and their teaching behaviours.

Despite the important number of teaching skills programs described in the literature, we could identify only five articles reporting some sort of needs assessment evaluating the specific skills residents need to teach.[4,6,11-13] Needs assessments were conducted as surveys,[11,12] interviews,[4] focus groups[6] or as objective structured teaching evaluations.[13]

Although these five needs assessments explored the needs as perceived by residents, only one looked at faculty and medical students' opinions on the subject.[6] This particular study focused mainly on identifying the teaching skills that were perceived as most important, however it did not explore which skills would require some training. Finally, the opinions of medical students and residents on the subject were not specifically compared.

Therefore, we felt there was a need to identify the optimal content for a residents' teaching skills curriculum in our environment before developing one for our postgraduate trainees. The aim of the study presented here was to identify the learning needs for residents in teaching-skills training (content and format) and compare the perspective of medical students, residents and program directors.

Methods

This needs assessment was an observational study with a cross-sectional design. The study population was composed of medical students (pre-clerkship and clerkship), residents from the postgraduate medical training programs and program directors, all from Faculté de médecine de l'Université Laval (Quebec City, Canada).

All program directors (n = 36), residents (n = 668) and medical students (n = 979) in training during the Fall

2008 trimester, were included in the study. No exclusion criterion was applied.

The questionnaire was developed based on an extensive literature review and was enhanced by a group of six external medical educators. The medical students' questionnaire assessed demographic data, explored the students' experience of being taught by residents and asked for the perceived content that should be taught in the residents' curriculum. The residents' questionnaire also assessed demographic data, as well as their teaching experiences and their preferences regarding the curriculum's format and content. The program directors' questionnaire assessed their perception of residents' teaching experiences, as well as the format and content they felt appropriate for the upcoming curriculum.

In December 2008, the medical students and residents were recruited through email invitations to participate in the study. Using the provided link, participants could access an online information form summarizing the goals of the teaching skills curriculum project, the rationale for this needs assessment, and the link to their respective online questionnaire. Program directors were each given a printed information form and questionnaire during their December meeting. Those who could not attend this meeting were sent the documents by email. A reminder was sent one month later. Data collection was allowed over a six-week period.

This project was approved by the Comité d'éthique de la recherche de l'Université Laval.

Format

Ten different curriculum formats (Table 3) were submitted to the residents and program directors, and they were asked to rank them from 1 to 10 according to their level of preference, 10 being the most preferred format.

Content

All study participants were provided a list of potential subjects that could be included in the curriculum (list of subjects presented in Tables 4, 5 and 6). The subjects were classified according to the CanMEDS competencies.[1] The participants were asked to rate (from 0 to 5 out of 5) the relevance of each subject and the residents' current performance on each task. The relevance was then divided by the performance to obtain the "content score", in order that a very relevant subject with poor resident performance would score higher than a subject with the same relevance but a higher performance.

Statistical analyses

Results are presented using descriptive statistics with means and standard deviations. Categorical data were analyzed using Chi Square or Fischer exact tests. Quantitative data were analyzed by *t*-tests or variance analyses. The significance level was fixed at 0.05 and a 95% confidence interval was set for the interpretation of content scores. Analyses were conducted using the SAS Software 9.1.

Results

Characteristics of study participants

Answers to the questionnaires were provided by 26 program directors (3/3 from the family medicine programs, 19/25 from other medical specialties and 4/8 from surgical specialties, total response rate 72.2%), 146 residents (69 junior residents and 77 senior residents, from the family medicine programs (n = 34) and other medical (n = 84) and surgical (n = 28) specialties, total response rate 21.9%), and 154 medical students (96/577 pre-clerkship students and 58/402 clerkship level students, total response rate 15.7%). The characteristics of the study participants are summarized in Table 1.

Residents' participation in teaching

Almost all medical students at the pre-clerkship level reported having had a resident as teacher at least once (only 4.5% were never taught by a resident). Medical students had a resident as teacher in 61 (24%) of their clerkship rotations, whereas residents reported being taught by colleagues in 35 (28%) of their rotations ($p<0.001$).

Residents can be involved at various levels of training. During pre-clerkship, they may make presentations in large-group teaching sessions, lead some teaching activities that are part of a larger course, be tutors for small-group teaching sessions or teach during clinical observation activities. At the clerkship and the residency training levels, they are mainly involved in clinical teaching. Table 2 summarizes the proportion of residents involved in teaching, as experienced by medical students and residents, and the perception of their involvement in these academic activities according

Table 1. Characteristics of study participants.

	Medical Students		Residents		Program Directors
	Pre-Clerkship	Clerkship	Junior	Senior	
Response rate	96/577 (16.6%)	58/402 (14.4%)	69/313	77/355	26.36
(n participants/total population)			(22.0%)	(21.7%)	(72.2%)
	154/979 (15.7%)		**146/668 (21.9%)**		
Gender	25/71	15/43	14/55	26/51	
(M/F)	**40/114**		**40.106**		16/10
Age	21 ± 3	24 ± 3	26 ± 3	28 ± 3	
(years)	**23(3)**		**27(3)**		N/A
Program	N/A	N/A			
Family medicine			19/34	15/34	3/3
Medical specialties			35/84	49/84	19/25
Surgical specialties			15/28	13/28	4/8

Family medicine residents were considered junior as PGY1 and senior when they were PGY2 or PGY3. Other specialty residents were considered junior as PGY1 and PGY2, and senior afterwards.

to the program directors.

Only a few residents (9.6%) answered they had some form of teaching-skills training, although 26.9% of program directors reported having some form of teaching-skills training in their program. Developing a formal teaching skills training curriculum was considered very or quite useful in 92.3% of medical students, 84.9% of residents and 88.0% of program directors.

The majority of residents (84.9%) answered they would be interested in teaching when they started their practice, while only 4.8% said they were not and the remaining (10.3%) answered they were unsure about teaching once they started their practice. Interest for teaching was not significantly different between men and women (p = 0.12). The teaching interest profile was similar when comparing junior and senior residents (p = 0.37), although the percentage of residents not interested in teaching tended to increase in the senior years (2.9% in juniors versus 6.5% in seniors). Finally, the teaching interest profile was not significantly different between family medicine residents and those from other medical and surgical specialties (p = 0.63).

Preferred curriculum format

Table 3 presents the junior and senior residents' preferences, as well as those of program directors, for the curriculum format. The formats were not assessed by medical students. The three preferred formats were *One day*, *Two consecutive days* and *A few one-day sessions over several months, with practicum and reflective work* for residents, and *One half-day*, *One day* and *Self-directed interactive online learning with available mentor* for program directors. The least preferred formats were *Evening session series*, *Self-directed interactive online learning with available mentor* and *One-month rotation in medical education* for residents, and *Evening session series*, *One-week rotation in medical education* and *One-month rotation in medical education* for program directors.

Preferred curriculum content

The relevance, performance and content score (obtained from division of relevance by performance - for statistical reasons, the relevance and performance scores were added to 1 to allow for a non null denominator (0/5 became 1/6, etc.), is provided for each suggested subject in Table 4 (PD), Table 5

Table 2. Teaching implication of residents.

	Students' Experience	Residents' Experience	Program Directors' *	*p*
Pre-clerkship				
Speaker in a lecture	51.3%	9.6%	0.0%	< 0.001
Teaching a part of a larger curriculum	82.5%	20.5%	57.7%	< 0.001
Small-group teacher (for whole semester)	50.0%	11.6%	26.9%	< 0.001
Clinical teacher for observation elective	24.7%	24.7%	7.7%	< 0.001
Other	3.9%	4.8%	19.2%	0.15
No teaching activity	4.5%	48.6%	26.9%	< 0.01
Clerkship				
% of rotations in which residents have a teaching role towards clerks	61.0 (24.4) %	38.9 (28.9) %	38.7 (28.7)%	0.97
Residency				
% of rotations in which residents have a teaching role towards other residents	N/A	18.5 (26.5)%	59.5 (32.2) %	<0.001

*Perception of resident involvement

(residents) and Table 6 (MS). Content scores having a confidence interval that included 1.0 (see Table 4) were considered non significant.

For program directors, the subjects with high content scores were: *Self-directed learning* (1.7 [1.3-2.2]), *Learning styles* (1.5 [1.3-1.7]), *Working with students in difficulty* (1.5 [1.3-1.8]), *Teaching conflict management* (1.4 [1.2-1.6]) and *Teaching professionalism* (1.4 [1.2-1.6]). The following topics did not obtain a significant content score: *Teaching clinical skills*, *Teaching management of common problems*, *Teaching on ward*, *Teaching in ambulatory care setting*, *Orientation at the beginning of a course or rotation*, *Teaching interprofessional collaboration*, *Teaching charting* and *Teaching the use of electronic medical resources*.

For residents, the curriculum subjects with the highest content score were: *Facilitating problem-based learning sessions* (1.8 [1.5-2.0]), *Working with students in difficulty* (1.7 [1.5-1.8]), *Small-group teaching* (1.5 [1.4-1.7]), *Indirect* supervision *strategies* (1.5 [1.4-1.6]), *Self-directed learning* (1.5 [1.4-1.6]) and *Learning styles* (1.5 [1.4-1.7]). The following topics did not obtain a significant content score: *Orientation at the beginning of a course or rotation*, *Teaching interprofessional collaboration*, *Teaching charting* and *Teaching professionalism*.

For medical students, the five curriculum subjects with the highest content score were: *Learning styles* (3.1 [2.1-2.7]), *Teaching health promotion and prevention* (2.7 [2.3-2.9]), *Teaching in the ambulatory care setting* (2.6 [2.2-2.9]), *Teaching with time constraints* (2.6 [1.9-2.5]) and *Direct supervision strategies* (2.6 [2.1-2.7]). For this group, all the proposed topics had a significant content score ratio, since no confidence interval included 1.0.

Discussion

This study not only identified the learning needs in resident teaching-skills training from the perspective of the residents, but also from the points of view of their trainees and program directors.

Only a few residents (9.6%) reported having already had some form of teaching-skills training. Moreover, only 26.9% of program directors reported having some form of teaching-skills training in their program. This is a major concern, since most of our residency training programs have two teaching skills workshops during their first year of training. We might hypothesize that some residents forgot they attended these workshops, or that they did not realized they had had this relevant training. Similar findings were previously reported by Gil et al. about feedback, where faculty reported providing more feedback than students perceived receiving.[14] Such findings are very preoccupying and underline that we must make explicit to workshop participants, and to their supervisors, the objectives of these activities and their purpose.

Table 3. Possible formats for a teaching skills curriculum.

Residents	Format Ranking	Program Directors
One day	1*	One half-day
Two consecutive days	2	**One day**
A few one-day sessions over several months, with practicum and reflective work	3	Self-directed interactive online learning with available mentor
One half-day	4	**A few one-day sessions over several months, with practicum and reflective work**
One-week rotation in medical education	5	Two consecutive days
Lunch time session series	6	Lunch time session series
Intensive weekend retreat	7	Intensive weekend retreat
Evening session series	8	Evening session series
Self-directed interactive online learning with available mentor	9	One-week rotation in medical education
One-month rotation in medical education	10	One-month rotation in medical education

*1 being the most preferred. Note: bolded formats are favored by both residents and program directors; shaded cells illustrate disagreement between residents and program directors. The format was not assessed by medical students.

Interestingly, 95.5% of medical students reported having been taught by a resident during their pre-clerkship years, whereas only 51.4% of residents stated they were ever involved in teaching at the pre-clerkship level. This might be explained by the involvement of a small *number* of residents in pre-clerkship teaching who meet most of medical students. There was also a surprising difference between the residents' experience in teaching and program directors' perceptions of their involvement (Table 2). A higher percentage of involvement was estimated by program directors than that reported by the residents themselves, particularly for pre-clerkship and residency level teaching. The correlation between residents' and program directors' perception of "resident teaching" was better for clerkship level teaching. This might be explained by a higher proportion of respondents from directors of residency programs in which many residents are involved as teachers, compared with a lower response rate among these residents. This would however be surprising, since residents interested in teaching are presumably more disposed to answer such a survey (selection bias inherent to this type of study). Another possible explanation might be that program directors are not well informed of their residents' teaching involvement at the pre-clerkship and residency levels. Finally, residents might also be underestimating their teaching involvement due to recall bias or because they teach without even noticing they do so, as the teaching is well-integrated into their daily tasks.

The content expectations are also very different between medical students, residents and program directors. Although some topics (*Learning styles*, *Working with students in difficulty* and *Self-directed learning*) were among the five highest scores for both residents and program directors, only *Learning styles* was ranked that high among students. Medical students would prefer to see residents learn about *Teaching in the ambulatory care setting*, *Teaching health promotion and prevention*, *Teaching with time constraints* and *Direct supervision strategies*. The program directors favored *Teaching conflict management* and *Teaching professionalism*, which were both among the residents' lower scores. Such differences should be addressed when designing the curriculum, to ensure the curriculum will be of interest to residents, but will also meet their students' and program directors' expectations.

Some topics that often emerged as relevant content areas for the curriculum did not obtain a high content score. One possible explanation is that performance on

these teaching activities is consistently high, such as *Teaching clinical skills*. This content should however not be discarded from the curriculum, since these teaching strategies can always be improved, and also because such motivating subjects might encourage attendance to the teaching skills curriculum.

Our three-fold environmental screening found interesting comparisons between residents and program directors about the preferred formats for the curriculum. Both residents and program directors agreed on *One day courses* and disliked the *Evening session series* and *One-month rotation in medical education*. However, although valued by program directors, *Self-directed interactive online learning with available mentor* was given one of the lowest scores among residents. The curriculum length is also of concern, since residents prefer *Two consecutive days* and *A few one-day sessions over several months, with practicum and reflective work* whereas their program directors favour *One day* or *One half-day*. Program directors do find teaching training relevant, but they wish it can be provided without limiting residents' clinical exposure. Residents seem to prefer a slightly longer curriculum, maybe to ensure better training, and also possibly because it would give them a break in their clinical tasks.

Our study identified content requirements that were similarly identified in previous needs assessments.[4,6,11-13] However, this is the first study to report data with a ratio between pertinence and current resident performance.

This study has some limitations. Since it was conducted as a voluntary online questionnaire, residents interested in teaching were probably more inclined to participate in the study (selection bias). Furthermore, the relevance and performance scores used to calculate the content score could be rated 0 out of 5. Zero could be attributed by some participants to indicate a non applicable issue, whereas for others it indicated an item judged very low. This limitation was not found to be a serious problem for relevance, since both a low relevance item and a non applicable item would be less likely to be included in the curriculum. The "0" score was however found rating commonly among medical students answers when residents' performance. It would be surprising to have many "non applicable" answers in this group, because the suggested items were all relevant to medical students. (Non applicable items would be understandable for some postgraduate training disciplines, e.g. clinical skills that are less relevant for medical imaging residents, but not for medical students who scored residents from all disciplines together.) We can therefore assume that "0" scores attributed by medical students were probably related to residents' poor performance on these items. This might also explain the high content scores and large standard deviations when compared to content scores of program directors and residents; groups where the score "0" was less common (given that a low denominator leads to a higher content score). Further studies using the content score method should therefore use a specific attribution for non applicable items to allow for more precise analyses.

Conclusion

In conclusion, this study allowed for a more complete appreciation of learning needs for teaching skills in postgraduate medical trainees. The program directors' and medical students' perception of the optimal format and content for residents' teaching-skills training showed some discrepancies when compared with residents' preferences. Awareness of the perspective of everyone will hopefully contribute to the development of new curricula and enhancement of existing programs in other institutions. Nevertheless, since program directors are largely involved in curriculum development for their respective specialties and since medical students are also well positioned to assess residents' teaching performance, we suggest that program directors, residents and medical students should all be consulted locally before organizing any intervention for teaching curricula.

Table 4. Relevance, performance and content score for each proposed subject according to program directors.

	Relevance (mean ± SD)	Performance (mean ± SD)	Content Score mean ± SD	Content Score 95% CI
MEDICAL EXPERT				
Teaching clinical skills (history / physical exam)	4.9 (1.4)	4.9 (0.8)	1.0 (0.4)	0.9-1.2
Teaching clinical reasoning	5.6 (0.6)	4.5 (0.8)	1.3 (0.3)	1.2-1.4
Teaching management of common problems	5.4 (1.0)	5.0 (0.5)	1.1 (0.2)	1.0-1.2
Teaching procedural skills	5.3 (1.2)	4.7 (0.8)	1.2 (0.3)	1.1-1.3
Teaching on ward	4.1 (1.7)	4.5 (0.7)	1.0 (0.3)	0.9-1.2
Teaching in ambulatory care setting	4.6 (1.6)	4.5 (0.8)	1.1 (0.3)	1.0-1.3
COMMUNICATOR				
Orientation at the beginning of a course or rotation	4.7 (1.2)	4.3 (1.1)	1.2 (0.5)	1.0-1.4
Teaching communication skills	5.4 (1.0)	4.3 (0.8)	1.3 (0.4)	1.1-1.4
Providing constructive feedback	5.4 (0.8)	4.4 (0.9)	1.3 (0.3)	1.2-1.5
Giving effective lectures	5.5 (0.9)	4.4 (0.6)	1.3 (0.2)	1.2-1.4
Small-group teaching	5.1 (1.4)	4.3 (0.6)	1.3 (0.3)	1.2-1.4
Facilitating problem-based learning sessions	4.5 (1.4)	4.0 (0.8)	1.2 (0.3)	1.1-1.4
COLLABORATOR				
Teaching interprofessional collaboration	5.0 (1.1)	4.4 (1.1)	1.2 (0.5)	1.0-1.4
MANAGER				
Teaching charting	5.3 (0.9)	4.7 (0.7)	1.2 (0.3)	1.0-1.3
Teaching with time constraints	5.0 (0.9)	4.0 (0.8)	1.3 (0.4)	1.1-1.5
Teaching conflict management	5.1 (0.8)	3.8 (1.0)	1.4 (0.5)	1.2-1.6
HEALTH ADVOCATE				
Teaching health promotion and prevention	5.1 (1.0)	4.3 (1.1)	1.3 (0.3)	1.1-1.4
SCHOLAR				
Direct supervision strategies	4.7 (1.3)	4.0 (1.1)	1.2 (0.3)	1.1-1.3
Indirect supervision strategies	4.7 (1.1)	3.8 (0.9)	1.2 (0.3)	1.1-1.4
Working with students in difficulty	4.6 (1.3)	3.3 (1.3)	1.5 (0.6)	1.3-1.8
Learning styles	4.6 (1.1)	3.5 (1.2)	1.5 (0.6)	1.3-1.7
Self-directed learning	5.0 (1.0)	3.5 (1.1)	1.7 (1.0)	1.3-2.2
Teaching evidence-based medicine	5.7 (0.8)	4.5 (0.8)	1.3 (0.3)	1.2-1.4
Teaching the use of electronic medical resources	5.5 (0.6)	5.0 (0.5)	1.1 (0.2)	1.0-1.2
PROFESSIONAL				
Teaching professionalism	5.4 (0.9)	4.3 (1.0)	1.4 (0.5)	1.2-1.6

Shaded cells illustrate non significant content scores (having a confidence interval that includes 1.0).

Table 5. Relevance, performance and content score for each proposed subject according to residents.

	Relevance (mean ± SD)	Performance (mean ± SD)	Content Score mean ± SD	Content Score 95% CI
MEDICAL EXPERT				
Teaching clinical skills (history / physical exam)	5.0 (1.4)	4.5 (1.3)	1.2 (0.6)	1.1-1.3
Teaching clinical reasoning	5.3 (1.1)	4.3 (1.0)	1.3 (0.6)	1.2-1.4
Teaching management of common problems	5.2 (1.2)	4.4 (1.0)	1.2 (0.5)	1.2-1.3
Teaching procedural skills	4.6 (1.6)	3.8 (1.4)	1.3 (0.6)	1.2-1.4
Teaching on ward	4.3 (1.7)	3.8 (1.4)	1.2 (0.5)	1.1-1.3
Teaching in ambulatory care setting	3.8 (1.6)	3.3 (1.4)	1.3 (0.7)	1.2-1.4
COMMUNICATOR				
Orientation at the beginning of a course or rotation	4.3 (1.4)	4.8 (1.3)	1.0 (0.6)	0.9-1.1
Teaching communication skills	4.4 (1.3)	4.0 (1.1)	1.2 (0.6)	1.1-1.3
Providing constructive feedback	5.3 (0.9)	4.1 (1.1)	1.4 (0.7)	1.3-1.5
Giving effective lectures	4.9 (1.2)	4.3 (1.1)	1.2 (0.4)	1.1-1.3
Small-group teaching	4.7 (1.3)	3.8 (1.4)	1.5 (1.1)	1.4-1.7
Facilitating problem-based learning sessions	4.5 (1.5)	3.3 (1.5)	1.8 (1.3)	1.5-2.0
COLLABORATOR				
Teaching interprofessional collaboration	4.1 (1.4)	4.3 (1.3)	1.1 (0.7)	1.0-1.2
MANAGER				
Teaching charting	4.4 (1.4)	4.5 (1.5)	1.1 (0.6)	1.0-1.2
Teaching with time constraints	4.8 (1.3)	3.9 (1.1)	1.3 (0.5)	1.2-1.4
Teaching conflict management	4.2 (1.3)	3.9 (1.2)	1.2 (0.6)	1.1-1.3
HEALTH ADVOCATE				
Teaching health promotion and prevention	4.4 (1.5)	4.0 (1.2)	1.2 (0.6)	1.1-1.3
SCHOLAR				
Direct supervision strategies	4.8 (1.4)	3.7 (1.3)	1.4 (0.7)	1.3-1.5
Indirect supervision strategies	5.6 (1.4)	3.4 (1.3)	1.5 (0.8)	1.4-1.6
Working with students in difficulty	4.6 (1.4)	3.2 (1.3)	1.7 (0.9)	1.5-1.8
Learning styles	4.7 (1.4)	3.4 (1.2)	1.5 (0.7)	1.4-1.7
Self-directed learning	4.7 (1.3)	3.5 (1.2)	1.5 (0.8)	1.4-1.6
Teaching evidence-based medicine	5.0 (1.2)	3.7 (1.2)	1.4 (0.6)	1.3-1.5
Teaching the use of electronic medical resources	4.5 (1.4)	3.7 (1.4)	1.4 (0.8)	1.3-1.5
PROFESSIONAL				
Teaching professionalism	4.3 (1.4)	4.4 (1.1)	1.0 (0.6)	1.0-1.1

Shaded cells illustrate non significant content scores (having a confidence interval that includes 1.0).

Table 6. Relevance, performance and content score for each proposed subject according to medical students.

	Relevance (mean ± SD)	Performance (mean ± SD)	Content Score (mean ± SD)	95% CI
MEDICAL EXPERT				
Teaching clinical skills (history / physical exam)	5.0 (1.3)	4.3 (1.6)	1.6 (1.4)	1.4-1.8
Teaching clinical reasoning	5.2 (1.4)	3.9 (1.7)	1.8 (1.6)	1.5-2.0
Teaching management of common problems	4.9 (1.6)	3.5 (1.8)	2.1 (1.8)	1.8-2.3
Teaching procedural skills	4.9 (1.5)	3.6 (1.9)	2.0 (1.8)	1.8-2.3
Teaching on ward	4.0 (2.1)	2.5 (1.9)	2.4 (2.0)	2.1-2.7
Teaching in ambulatory care setting	3.6 (2.0)	2.0 (1.6)	2.6 (2.0)	2.2-2.9
COMMUNICATOR				
Orientation at the beginning of a course or rotation	4.3 (1.6)	3.8 (1.9)	1.7 (1.7)	1.5-2.0
Teaching communication skills	4.3 (1.5)	3.1 (1.8)	2.0 (1.6)	1.8-2.3
Providing constructive feedback	5.2 (1.2)	3.5 (1.6)	2.0 (1.6)	1.8-2.3
Giving effective lectures	4.8 (1.5)	3.6 (1.8)	1.9 (1.7)	1.7-2.2
Small-group teaching	5.0 (1.4)	4.2 (1.7)	1.7 (1.6)	1.4-1.9
Facilitating problem-based learning sessions	4.8 (1.5)	3.5 (1.8)	1.9 (1.5)	1.6-2.1
COLLABORATOR				
Teaching interprofessional collaboration	4.0 (1.8)	2.5 (1.7)	2.2 (1.8)	2.2-2.8
MANAGER				
Teaching charting	4.3 (1.8)	2.5 (1.8)	2.5 (2.0)	2.3-2.9
Teaching with time constraints	4.3 (1.8)	2.9 (1.8)	2.6 (2.0)	1.9-2.5
Teaching conflict management	3.9 (1.8)	2.1 (1.6)	2.2 (1.8)	2.4-3.0
HEALTH ADVOCATE				
Teaching health promotion and prevention	4.5 (1.6)	2.6 (1.7)	2.7 (2.0)	2.3-2.9
SCHOLAR				
Direct supervision strategies	4.3 (1.9)	2.6 (1.8)	2.6 (1.9)	2.1-2.7
Indirect supervision strategies	4.0 (1.8)	2.5 (1.8)	2.4 (2.0)	2.1-2.7
Working with students in difficulty	4.3 (1.9)	1.9 (1.4)	2.4 (1.9)	2.8-3.5
Learning styles	4.6 (1.6)	2.8 (1.7)	3.1 (2.0)	2.1-2.7
Self-directed learning	4.7 (1.6)	3.0 (1.8)	2.4 (1.9)	2.1-2.7
Teaching evidence-based medicine	4.5 (1.5)	3.2 (1.9)	2.4 (1.9)	1.9-2.5
Teaching the use of electronic medical resources	4.3 (1.8)	2.6 (1.9)	2.5 (1.9)	2.2-2.8
PROFESSIONAL				
Teaching professionalism	4.4 (1.6)	3.4 (1.9)	2.0 (1.7)	1.8-2.3

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