

Postprint Version	1.0
Journal website	http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-2923.2007.02842.x
Pubmed link	http://www.ncbi.nlm.nih.gov/pubmed/17822413
DOI	10.1111/j.1365-2923.2007.02842.x

This is a NIVEL certified Post Print, more info at <http://www.nivel.eu>

Senior medical students' appraisal of CanMEDS competencies

JANY RADEMAKERS, OLLE TEN CATE, NIENKE DE ROOY UNIVERSITY MEDICAL CENTER UTRECHT, SCHOOL OF MEDICAL SCIENCES, THE NETHERLANDS

CONTEXT In 2003 the Dutch Central College of Medical Specialties presented guidelines for the modernisation of all medical specialty training programmes in the Netherlands. These guidelines are based to a large extent on the CanMEDS (Canadian Medical Education Directives for Specialists) 2000 model, which defines 7 roles for medical specialists.

This model was adjusted to the Dutch situation. The roles were converted to 7 fields of competency: Medical Performance; Communication; Collaboration; Knowledge and Science; Community Performance; Management, and Professionalism.

OBJECTIVE As changes in postgraduate training will probably be most effective if future trainees recognise their value, we set out to determine how senior medical students rated these fields of competency in terms of their importance.

METHODS We carried out a study at University Medical Centre (UMC) Utrecht, the Netherlands, in which 80 Year 6 medical students answered a questionnaire in which they rated the importance of each of 28 key competencies within the 7 competency fields.

RESULTS Although all key competencies were regarded as important (averages ≥ 3.8), Professionalism and Communication scored highest on the student ratings. Management was assessed as least important.

CONCLUSIONS It is interesting that medical students acknowledged the importance of competencies other than those involving medical expertise and performance. It confirms the opinion that educating doctors is currently viewed as much more than providing theoretical and clinical knowledge and skills.

The CanMEDS framework is appreciated by Dutch medical students. The fact that all competencies are seen as important adds to their face validity and therefore to their usefulness as a basis for postgraduate training.

[BOX 1]

INTRODUCTION

In 2003 the Dutch Central College of Medical Specialties presented guidelines for modernization of all medical specialty training programmes in the Netherlands. These guidelines are based to an important extent on the CanMEDS 2000 model¹, in which seven main roles are defined for the medical specialist (medical expert/clinical decision maker, communicator, collaborator, manager, health advocate, scholar, professional). This model was adjusted to the Dutch situation. The Dutch Central College of Medical Specialties imported the CanMEDS framework as an excellent tool to revise postgraduate medical training in the Netherlands, but made adaptations to tailor the model to the Dutch health care and training circumstances. Instead of roles, seven competency fields were defined, covering the same CanMEDS domains, with four key competencies per field (for a description of the competency fields and key competencies see table 1)^{2,3}. Before the year 2007, all specialty training programs should be oriented towards these competency fields.

The Dutch medical specialist societies have reacted positively to the competency model and are starting to adjust the structure and objectives of their training programmes to it^{4,5}. Some of the key competencies can directly be used as a starting point for the content of training programmes and assessment, while others should be further specified for the different specialties. The adoption of CanMEDS was not preceded by a large survey among stakeholders, as it was expected that Canadian health care and education was similar enough to Dutch circumstances to warrant this change. Furthermore, specialist societies understood the need for modernization and understood that adopting a uniform competency model (which can be further specified for specific disciplines) would enable collaboration between the hospitals and ensure the link with undergraduate medical education⁵.

Since change in educational strategies in postgraduate training will probably be most effective if future trainees recognise the importance of the new objectives of the programs, we decided to survey future physicians as to their appraisal of the CanMEDS competencies. In addition, we were interested to examine differences among students, according to their age, sex and career preference. To determine how medical students value these competencies a study was done at the University Medical Center (UMC) Utrecht, the Netherlands. We hypothesized that medical performance would be regarded as most important competency, and that among the other six competencies communication and professionalism would be valued as more important than collaboration, knowledge and science, management and community performance (in this order).

The undergraduate medical curricula in the Netherlands have not yet been structured around these fields, but the individual competencies are (more or less explicitly) addressed in the programs. Some fields might be more visible in the curriculum and therefore more recognizable to students (e.g. medical performance and communication) than others (e.g. management). The students in our study had recently been informed about the CanMEDS competencies, as they were to comply with them in the course of the final year. In a recent Utrecht undergraduate medical curriculum reform, the CanMEDS framework was used to reshape the final year. The particular students, being at the start of this final year, had just been informed about this model in a written and oral instruction. They were not acquainted with the CanMEDS framework before their final year. They were enrolled in an innovative medical curriculum, with early clinical clerkships and a PBL-learning environment.

Methods One hundred and twenty students entering their final year of undergraduate medical training (i.e. after 5 years of training, including the clinical clerkships) were asked to fill out a questionnaire about future career plans. Part of this questionnaire was a list of the CanMEDS competency fields specified in 28 key competencies, which they were asked to rate on a 5-point Likert-type scale (1=very unimportant, 5=very important). The scores were analysed with SPSS. Means and standard deviations were calculated for all individual items

(key competencies). For each group of four items under one competency field heading, the overall score was calculated as the mean score. To establish the reliability of the overall scores, the coherence of each group of items was measured by the internal consistency (Cronbach's alpha). Finally, corrected items-total correlations (r_{it}) were calculated to appraise the contribution of each individual item to the valuation of the competency field as a whole. The higher the r_{it} score of an individual item, the more it contributes to the overall score of the competency field. Statistical differences between subgroups, according to gender, age and specialty difference were computed with the Mann-Whitney test. The significance level was specified at .01 in accordance with the Bonferroni adjustment procedure.

RESULTS

Eighty students responded (67%). The internal consistency of each overall score varied from 0.71 to 0.88, sufficient to regard each competency field a coherent entity. All items contributed highly to the valuation of the competency fields, but interestingly the first item ('having adequate knowledge and skills according to the professions' current standards') showed the lowest item-total correlation.

In general, students rated all competency fields as important. Mean scores varied from 3.96 (management) to 4.40 (professionalism) (see table 1).

[TABLE 1]

As we expected, the competency fields medical performance, communication and professionalism were rated as highest, but not in the order we presumed. Unexpectedly, on average community performance scored higher than management and knowledge and science.

The data were further analysed by age, gender and specialty preference.

The age range of the students was 22-31 (Mean: 24.7; SD: 1.8). There were no statistically significant differences between the ratings of younger (≤ 24 years) versus older (≥ 25 years) students.

[FIGURE 1]

When male and female students were compared, there were no statistically significant differences between the ratings of men and women. However, the data show a tendency that communication is regarded as more important by female students ($p=.03$).

Students were also classified in two groups with respect to their career preference (surgical, medical or other specialty (N=60), general practice (N=17)). When these groups were compared, there were no statistically significant differences.

DISCUSSION

Though all key competencies were regarded important, professionalism and communication scored highest on the students' rating. Management was assessed as least important, but still 3.96 on a 5-point scale on average. The fact that all competencies are seen as important by the students adds to their face validity and therefore to their usefulness as a basis for postgraduate training and the development of outcome measures in medical education programs.

Knowledge and skills are considered the most important single item (mean 4.6), but interestingly enough it shows the lowest item-total correlation. This can be interpreted as a sign that this item is considered to be of a different quality, compared to the other items. In the Dutch translation, this item diverges the most from the CanMEDS framework, as it

Met opmaak:
opsommingstekens en
nummering

actually does not reflect a competency (an ability to act) but rather a state of mind. Students apparently have recognised this difference in some way.

It is interesting that all medical students acknowledged the importance of other competencies than medical expertise and performance. It confirms the view that educating medical doctors is considered much more than acquiring theoretical and clinical knowledge and skills. Although there were no statistically significant differences between the subgroups (by age, gender and specialty choice) there was a suggestion that women rated communication as more important. Further research into different 'competency profiles' (e.g. according to gender) would be useful: if students vary in their appraisal of individual competencies they might be more motivated to invest in the development of the competencies they consider most important, which could be associated with differences in later clinical performance. E.g., students with interest in psychiatry may anticipate on a career in this direction by realising that Communication is an important competency field, whereas for those with interest in anaesthesiology or radiology, Collaboration may need more emphasis. If we can show students how important it is to develop a profile to match their wishes for the future, this may boost their motivation.

It would be interesting to explore the determinants of these 'competency profiles'. Since there are no significant age-related differences, the profile doesn't seem to be the result of aging or educational influences, but more inherent to the students' "content conception" of the profession⁶, i.e. of what it means to be a medical doctor and a personal preference for what kind of doctor one wants to be. It would also be interesting to compare the scores of the medical students in this study to scores of current medical doctors, to establish whether the reality of everyday practice makes the appraisal of competency fields and key competencies different. This survey was carried out in one medical school in the Netherlands, but we have no reason to believe that in other schools students would judge differently about the CanMEDS framework. However, a study among a larger sample of students from different medical schools in the Netherlands would add to the validity of the conclusions.

REFERENCES

- ¹ Frank JR, Jabbour M, Tugwell P, et al. Skills for the new millenium: report of the societal needs working group, CanMEDS 2000 Project. *Annals Royal College of Physicians and Surgeons of Canada* 1996; 29:206-216.
- ² Central College of Medical Specialties (CCMS). Kaderbesluit; november 2004. http://knmg.artsennet.nl/uri/?uri=AMGATE_6059_100_TICH_R1586801395168486
- ³ Bleker OP, Ten Cate ThJ, Holdrinet RSG. General competencies of the future medical specialist. *Dutch Journal of Medical Education*, 2004; 23 (1): 1-14.
- ⁴ Bleker OP. New beginnings, fresh sounds (Editorial). *J Psychosom Obstet Gynecol* 2004; 25: 177-178.
- ⁵ Borleffs JCC, Ten Cate ThJ. Competency-based training for internal medicine (Editorial). *The Netherlands Journal of Medicine* 2004; 62, 10: 344-346.
- ⁶ Nieuwhof MGH (†), Rademakers JJDJM, Kuyvenhoven MM, Soethout MBM, Ten Cate ThJ. Students' conceptions of the medical profession; an interview study. *Medical Teacher* 2005; 27,8,709-714.



Met opmaak:
opsommingstekens en
nummering

TABLE, FIGURE AND BOX

box 1

Overview

What is already known on this subject

The CanMEDS framework has focused on postgraduate training and receives broad acceptance. We do not know how it is perceived by medical students.

What this study adds

Our study supports the notion that medical students today are fully supportive of the CanMEDS competency objectives.

Students regard the competencies represented by Professionalism and Communication as no less important than those under Medical Performance.

Suggestions for further research

Further research into different 'competency profiles' is recommended: students vary in their appraisal of individual competencies and may be more motivated to invest in the development of competencies they consider more important.

Table 1 Competency fields and key competencies, as appraised by senior medical students (1 = very unimportant, 5 = very important)

Competency role (field) and key competencies	n	Mean	SD	Rit	α
1 Medical expert (Medical Performance)	79	4.33	0.42		0.79
The medical specialist:					
• has adequate knowledge and skills according to the profession's current standards	81	4.58	0.50	0.31	
• adequately applies the diagnostic, therapeutic and preventive possibilities of the discipline, in an evidence-based way wherever possible	80	4.34	0.50	0.44	
• delivers effective and ethical patient care	80	4.34	0.53	0.62	
• quickly finds necessary information and applies it adequately	79	4.06	0.63	0.56	
2 Communicator (Communication)	79	4.35	0.47		0.80
The medical specialist:					
• establishes adequate therapeutic relationships with patients	79	4.30	0.59	0.50	
• listens carefully and obtains relevant patient information effectively	80	4.48	0.57	0.59	
• adequately discusses medical information with patients and their families	80	4.46	0.59	0.59	
• reports adequately on patient cases in oral and written ways	80	4.15	0.64	0.55	
3 Collaborator (Collaboration)	78	4.14	0.52		0.88
The medical specialist:					
• consults effectively with other doctors and health care providers	79	4.28	0.62	0.57	
• refers adequately to other health care professionals	79	4.14	0.55	0.57	
• delivers adequate collegial advice	79	4.13	0.59	0.64	
• supports effective interdisciplinary collaboration and chain care	78	4.03	0.66	0.54	
4 Scholar (Knowledge and Science)	78	4.05	0.52		0.79
The medical specialist:					
• assesses medical information critically	80	4.19	0.64	0.56	
• contributes to the development of professional, scientific knowledge	80	4.01	0.74	0.57	
• develops and maintains a personal ongoing education plan	78	3.97	0.70	0.41	
• contributes to the education of students, residents, colleagues, patients and others involved in health care	78	4.04	0.63	0.56	
5 Health advocate (Community Performance)	79	4.13	0.48		0.71
The medical specialist:					
• knows and identifies the determinants of illnesses	80	4.15	0.66	0.65	
• contributes to the health of patients and the community	79	4.05	0.78	0.41	
• acts according to relevant legislation	80	4.09	0.62	0.57	
• acts adequately in case of incidents in health care	80	4.23	0.59	0.59	
6 Manager (Management)	79	3.96	0.51		0.83
The medical specialist:					
• finds an adequate balance between professional patient care and personal development	79	3.92	0.66	0.53	
• works effectively and efficiently in a health care organisation	80	4.08	0.61	0.60	
• allocates available health care resources wisely	80	4.03	0.55	0.49	
• uses information technology to optimise patient care and lifelong learning	80	3.83	0.69	0.46	
7 Professional (Professionalism)	80	4.40	0.52		0.87
The medical specialist:					
• delivers high-quality patient care with integrity, honesty and compassion	80	4.45	0.65	0.52	
• exhibits appropriate personal and interpersonal professional behaviour	80	4.44	0.63	0.55	
• is conscious of the limits of his or her personal knowledge and acts within these limits	80	4.38	0.58	0.63	
• practises consistently with the ethical standards of the profession	80	4.34	0.59	0.59	

SD = standard deviation

Figure 1 Appraisal of fields of competency by gender. MedP = Medical Performance; COM = Communication; COL = Collaboration; K & S = Knowledge and Science; ComP = Community Performance; MAN = Management; PRO = Professionalism

