A Case Study of the Implementation of a Competency-based Curriculum in a Caribbean Teaching Hospital

JJ Koeijers[1], JO Busari[2, 3], AJ Duits[4, 5, 6]

ABSTRACT

Objective: *Several teaching hospitals are currently modifying their curriculum to comply with the changing demands in medical education. As a result, we decided to evaluate whether a competency-based curriculum implemented in a Caribbean teaching hospital fulfilled the requirements as defined by the CanMEDS framework.*

Methods: *We made use of a triangulation method in the survey to obtain information on the educational process. Two separate methods were used consisting of site visits by visiting professors and a medical educator. The focus was on the structure, content and assessments of the educational activities.*

Results: *Major recommendations included increased involvement of medical specialists in the educational activities in the clinical workplace. There was need for improvement of communication between medical specialists, patients, nurses, trainees and residents. Overall, improvements were observed in the structure of clinical rotations and content of the training programme.*

Conclusion: *The implemented assessment programme provided necessary information for effective evaluation of the competency-based curriculum. We were able to identify new and feasible methods for improving the curriculum in our educational setting.*

Keywords: Assessment, competency-based curriculum, teaching hospital

Un Estudio de Caso de la Implementación de un Currículo Basado en Competencias en un Hospital Docente del Caribe

JJ Koeijers[1], JO Busari[2, 3], AJ Duits[4, 5, 6]

RESUMEN

Objetivo: *Varios hospitales docentes están actualmente modificando sus currículos a fin de satisfacer las demandas cambiantes de la educación médica. Por tal motivo, se tomó la decisión de evaluar si un currículo basado en competencias puesto en marcha en un hospital docente del Caribe cumplía con los requerimientos definidos por el programa de formación médica conocido como CanMEDS Framework.*

Métodos: *Se hizo uso de un método de triangulación en el estudio, a fin de obtener información sobre el proceso educativo. Se usaron dos métodos separados consistentes en visitas de inspección realizadas por profesores visitantes y un educador médico. La atención se centró en la estructura, el contenido, y la evaluación de las actividades educativas.*

Resultados: *Las recomendaciones principales incluyeron la necesidad de aumentar la participación de médicos especialistas en el lugar donde los estudiantes realizan su trabajo clínico. Se vio la necesidad de mejorar la comunicación entre especialistas médicos, pacientes, enfermeras, entrenados, y residentes. En general, se observaron mejoras en la estructura de las rotaciones clínicas y el contenido de los programas de entrenamiento.*

From: [1]Department of Internal Medicine, St Elisabeth Hospital, Curaçao, [2]Department of Paediatrics, Atrium Medical Centre, the Netherlands, [3]Department of Educational Research and Development, Faculty of Health, Medicine and Life Sciences, Maastricht University, the Netherlands, [4]University Medical Centre Groningen (Institute for Medical Education) and University of Groningen, the Netherlands, [5]Red Cross Blood Bank Foundation, Curaçao and [6]Department of Medical Education, St Elisabeth Hospital, Curaçao.

Correspondence: Professor AJ Duits, St Elisabeth Hospital, Breedestraat Otrabanda 193, Curaçao, Netherlands Antilles. Fax (005) 999-4618431. E-mail: ajduits@gmail.com

Conclusión: *El estudio realizado proveyó la información necesaria para la evaluación efectiva del currículo basado en competencias, e hizo posible identificar métodos nuevos y factibles para mejorar los planes de estudio en nuestro contexto educacional.*

Palabras claves: Evaluación, currículo basado en competencias, hospital docente

West Indian Med J 2012; 61 (7): 727

INTRODUCTION

The professional training of medical doctors has been subjected to several changes in the last couple of years and competency-based training has emerged from this process as one of the major changes. In several countries in Europe and North America, many professional medical institutions have revised their training programmes and different professional roles have been defined to describe the desired competencies of future medical doctors. The seven professional competencies as applied in Canada and the Netherlands (1, 2) for example, have been culled from the essential role and key competencies of specialist physicians of the Royal College of Physicians and Surgeons, Canada (3, 4) and focus on the doctor's role as: medical expert, communicator, collaborator, manager, health advocate, scholar and professional. There is a known variation in the structure of the various national medical training programmes worldwide and compared to countries in Europe, North America and Australia, information on the quality of content and structure of the medical curricula in Caribbean medical institutions is sparse (5–9).

Current developments in competency-based medical education (CBME) present both possibilities and challenges for undergraduate and postgraduate medical training. Competency-based medical education does not specify particular learning strategies or formats, but rather provides a clear description of intended outcomes. At the same time, the implementation of CBME in undergraduate and postgraduate medical education poses challenges for curriculum design, student assessment practices, teacher preparation, and systemic institutional change, all of which have implications for the learning process. Although implementing competency-based training in postgraduate medical education poses many challenges for educators, it ultimately requires a demonstration that the learner is truly competent to progress in training or move to the next phase of a professional career. Making this transition requires change at virtually all levels of the training and the key components of this change process include the development of valid and reliable assessment tools *eg* work-based assessment using direct observation, frequent formative feedback and learner self-directed assessment, active involvement of the learner in the educational process and intensive faculty development that addresses curricular design and the assessment of competency (10–12).

While the emergence of competency-based training is bringing uniformity to the way medical doctors are being trained, it is unclear whether this applies to the training graduates receive from medical institutions in the Caribbean. This point is buttressed by the concerns over the lack of uniform oversight of the educational processes in the region, the rapid growth of new medical schools, and the continuing concerns regarding the quality of training being offered at institutions in the region (5, 8). Furthermore, a study of the performance of physicians who attended medical schools in the Caribbean showed considerable variation in quality indicators (5).

The Saint Elisabeth Hospital is the largest hospital of the Dutch Caribbean islands. The institution has 422 beds and provides services in all major clinical specialties, including adult, paediatric and neonatal intensive care. The hospital has a close professional alliance with tertiary medical institutions in the Netherlands and provides training services for Dutch medical students and residents. The hospital is a full affiliate of the University Medical Centre Groningen (UMCG) in the Netherlands. The scope of its programmes include accredited residency training and pre-residency training (8). The main curriculum of the undergraduate training programme is catered for by the UMCG while the curriculum of the residency-training programme is in line with the recommendations of the Dutch Medical Specialist Registration committee (MSRC).

In 2007, a new competency-based training programme implemented by the UMCG (G2010) was introduced in the hospital (13). At its inception, it was clear that a well-defined educational strategy was necessary to implement the curriculum and at the same time evaluate and monitor the impact on the quality of the professional training of medical residents and students. For this reason, a clearly defined quality assessment strategy became a prerequisite for evaluating and monitoring the implementation process.

The objective of this study was hence, to evaluate whether the medical training programme in a Caribbean hospital fulfilled the requirements of a competency-based training hospital as defined by the CanMEDS framework and in accordance with the requirements for an affiliated teaching hospital with the Dutch medical university centre's G2010 curriculum.

SUBJECTS AND METHODS

A mixed method (triangulation) research approach was used in this study. Methodological triangulation or mixed method research allows for the effective use of information gathered

by different individual methods and aims at strengthening research design and the ability to interpret the outcome data. The data input was qualitative in nature, derived from internal audits by peer assessors and audits of the educational process in five different clinical departments by an educator (14).

Over a period of 18 months, four visiting professors intricately involved in academic medical training programmes in the Netherlands and trained as educators for competency-based curriculum visited the hospital at determined intervals. During these visits (≥ 5 days), peer assessments (audits) of the department of internal medicine were conducted. In the first phase of this assessment programme, the department was considered to be representative for all teaching departments of the hospital.

The qualitative data from the visiting professors' observations were obtained with the help of standardized assessment charts *ie* departmental portfolio forms, a novel instrument developed to evaluate and monitor the educational activities of the different specialty departments (9). Besides the visiting professors' data collection, a medical educator (also employed in the Netherlands) performed an audit of the educational climate in the hospital on two separate occasions in the same 18-month period of this study. During a five-day visit, the training programmes of five different departments (paediatrics, obstetrics and gynaecology, internal medicine, neurology and surgery) were evaluated on separate days (direct observation in practice). The assessment strategy employed included: 1) direct observations of the educational climate *eg* content, quality and frequency of educational activities in the clinical workplace and 2) focus group interviews with the medical residents and attending physicians. The focus group interviews with the residents and attending physicians were conducted separately to corroborate or refute the educator's findings. The assessment of the educational climate and quality of supervision was conducted using a standardized evaluation form that was designed to fit the local education context. The qualitative data generated from these two assessment approaches were combined for further analysis. Ethical approval was not required for this study. The information gathered was treated anonymously.

The results of the peer assessments by the visiting professors were collected and analysed separately by the three authors. All authors met twice to discuss their findings after which consensus was reached and the findings synthesized in a final report. The findings of the educator following the site visits were also prepared and submitted to the different authors for feedback. The results of the two separate investigations were subsequently combined and an overall analysis was performed to answer the research questions.

RESULTS

1. *Peer assessment of the department of internal medicine by visiting professors*

All of the visiting professors commented on the structure, contents and assessments of educational activities within the department. The results, shown in Table 1, illustrate that the assessors observed improvements in the educational process over time. The structure of the medical programme showed improvement over the study period with visible and clearly defined clinical rotations at the end. Structured rotations were available after 18 months, including a proposal for a new structured outpatient clinic rotation.

Another finding from the assessments was that the content of the training programme required further development; at the start of the assessment programme there was no schedule available and clinical presentations were frequently annulled.

Several months after the project was initiated, however, specific improvements were observed, which included an increased number of clinical meetings that were planned based on the provided feedback. Formal weekly programmes were designed and implemented which included clinical teaching, grand rounds and bedside teaching sessions. Another remark, at the beginning of the study, concerned the poor attendance of both the teaching staff and trainees at clinical meetings. The visiting professors provided little feedback on assessment, although there was clear consensus on the fact that only a few medical specialists were fully engaged in the educational process.

2. Assessment of the educational climate and quality of supervision by the visiting medical educator

The findings of the educator were reported in line with the seven CanMEDS competencies and G2010 curriculum. The separate reports from the individual focus group interviews were analysed, coded and clustered into themes. All competency areas except that of health advocate, were critically observed, evaluated and commented upon. The competency "health advocate" was purposely left out as this was difficult to evaluate during the five-day audit and the context being within a predominantly hospital driven setting. The two competencies most commented upon were "medical expert" and "communication" (Table 2). The important findings from the educator's observations included the insufficient involvement and support by medical specialists for medical residents both on the wards and during educational activities, as well as poor communication with patients, nurses, trainees and residents. There was also no assessment registers available for structured evaluations of medical residents and students.

Table 1: Synthesis of all the observations provided by the visiting external professors

Curriculum	Components	Observations	Suggestions/Remarks
Structure	Are there clearly defined training periods? *ie* wards, outpatient clinics? Are the durations of the different training periods clearly defined? Are there appointments before and after the training period? Are learning aims defined/are performance indicators defined?	[a]**1.** Training periods are stated on paper, however, this structure is not identifiable in practice. Specific learning goals are not defined **2.** On paper there are training periods but not in place in practice. A clear structure is lacking. All specialists have to participate in the educational process. Supervision is not optimal. The content of the general internal medicine clinical rotation is extensive. **3.** Outpatient clinics rotation due to the small patient load cannot be considered a real training period. Nephrology could be a formal rotation as stated on paper. **4.** Clinical rotations available on the male and the female wards. It is possible to participate in a nephrology rotation. Outpatient rotation is possible. Duration of the different training periods should be clearly stated.	**3.** Outpatient clinics rotations could be used as a supplement to the clinical rotations on the ward
Contents	Are there aspects of the curricular content that are clearly identifiable? Are there clearly recognizable schemes with the topics for meetings and list of speakers? Are there rules/agreements about the number of presentations/case reports for residents and staff members? Which of these components were recognizable? . Continuing medical education *eg* clinical teaching sessions . Presentations (PICO/critical appraisal of topics/Clinical case presentations/Grand rounds) . Scientific output (case reports/research studies) . Conference attendance . Trainings/continuing education (*eg* PALS/APLS) . Self study (individual learning moments)	**1.** Radiology meeting: morning ("hand-over") report of good quality. Not all specialists are present at the morning reports. Meetings well scheduled, unfortunately there are too many cancellations. Problem solving presentations should be included. Better technical tools should be made available for these meetings. Clinical teaching session: present but is often cancelled. Presentations: were given – Scientific output: None. A lot of potential material available. Conference attendance: not discussed. Training/continuing medical education: None. Individual learning moments: present; the residents should be stimulated to do this. **2.** Schedules are lacking. **3.** Week rosters in place. **4.** Schedules are present. Necrology meeting is lacking. Case presentation, clinical conference, ACLS once per three months. Stimulate self-study in residents.	**1.** Time has to be made available for clinical presentations. Residents should be stimulated to participate more in research activities. Ensure that there are enough computers in place. Stimulate the resident to engage more in self-education. **2.** More structure in educational activities. Clear schedules showing when the different lectures take place. Organization of specific teaching moments/grand rounds when visiting professors are around. Suggestion for a complication, clinical, pathology and oncology meeting. Internet access should be available. **3.** Organize special seminars, teaching sessions when visiting professors are on site. **4.** Delegate the responsibility of organizing educational meetings to residents.

Table 1 (Cont'd): Synthesis of all the observations provided by the visiting external professors

Curriculum	Components	Observations	Suggestions/Remarks
Assessment	Did you observe full participation of staff members in the appraisal process? Is there a scheme/plan present for the evaluations? Who is, according to you, responsible for appraisal tasks? Which of the methods /instruments are present according to have taken place? Resident: . Portfolio . Short practice appraisals . Self reflection . Structured appraisal . Structured test/Exams . Tutorage . External appraisals	**1.** Not filled in. **2.** Short practice appraisals and portfolio. **3.** No observations. **4.** Supervisors of the ward do the assessment.	**4.** Assessment forms should be used. Learning goals should be addressed. Short clinical appraisals are performed sporadically. Some supervisors are not interested in the education of the residents. Feedback on a presentation would be nice.
	Med Specialist: . Train the teachers . Evaluation quality of supervision . Peer audits of individual performance . External visitation	**1.** Responsibility for the training process is only carried by some specialists. **3.** Training is carried by some specialists. **4.** Not everybody is involved.	**1.** Specialists should make more use of the knowledge and expertise of visiting professors. **4.** All supervisors must be involved in the educational process.

[a]the four different visiting professors have been numbered, from the first visiting to the last with their comments related to the number they have been assigned:
1 = March 2007, 2 = May 2007, 3 = August 2007, 4 = November 2008

DISCUSSION

One of the important comments made during the first visit of the visiting professors was that the clinical rotations were not well-defined. Fortunately, this aspect of the training programme changed positively in the course of the 18 months of the survey. This was achieved by relocating the residents/interns to three specific wards, rotating them through the different wards and making the rotation more explicit. An interesting finding in the survey was the discrepancy between the amount of feedback provided on assessments by the visiting professors and that by the educator. The visiting professors hardly provided any comments on the assessment of the medical trainee/resident during their visits while the educator clearly stressed the need for an assessment plan or structure. It is unclear why the visiting professors failed to provide comments on the aspect of assessment, though it is assumed that it may have been due to a couple of factors namely: insufficient time to adequately evaluate the assessment structure, insufficient opportunity to conduct observations or because the emphasis was put on other aspects of the curriculum. There was agreement by the visiting professors and educator that only a few medical specialists were involved in the education of the medical students and residents. The educator commented on the input from the different clinical teachers and how, if applied properly, it could improve the quality of learning. He added that this should further be exploited and that the clinical teachers should be more active in the day-to-day practice with the trainees/residents on the wards, coaching them in the process. There was also concern about the quality of communication between the medical specialists and the different stakeholders in the hospital *ie* patients, nursing staff, medical residents and students. The strength of this study lies in the fact that the information we found was gathered from different sources *ie* visiting professors and an educator which made it possible to evaluate different areas of the medical education programme from both a practical and technical point of view. The visiting professors provided information of what was lacking to comply with the regulations of the training programme and the educator gave tools for instituting these improvements.

An important consideration worth mentioning about this study is the fact that we cannot completely rule out the subjectivity of the visiting professors. The form that we designed for the visiting professors to fill in their observa-

Table 2: Outcome of the medical educator's observations including the focus group interviews from the five clinical departments

Competencies	Result of observations	Recommendations for improvement
Communication	. Mobile phones cause a lot of disturbance during rounds. . Attending physicians' interactions with interns or residents lack evident proof of value, respect and admiration. . Clear demonstration of inappropriate bedside manners by attending physician or resident towards patients or the nurse. . Little room for active trainee participation during ward rounds and debriefing.	. Set mobile phones to silent/meeting mode during clinical meetings or ward rounds. . Work needs to be done to improve thecommunication between medical staff and residents including nursing staff and patients. . Trainees should participate more actively during rounds and debriefings.
Collaboration	. The quality of the combined meetings involving the radiology department and the departments of internal medicine and neurology is good and educative. . The attendance of participating physicians at these meetings is very poor.	. Specialists should be present at meetings as their input also improves the quality of the learning experience.
Medical expert	. Tutorials and clinical lectures are of good quality. . There are sufficient clinical situations/critical incidents for teaching and learning purposes. . Residents lack coaching in their role as supervisors of medical students. . Presentation of clinical presentations and conducting effective clinical workup can be improved. . More emphasis on the assessment of the interns and residents performances. . Enough time was set out for rounds.	. Use of critical incidents and other clinical moments for educational purposes. . More opportunities should be created for structured and formal presentations by attending doctors and residents. . Residents should be coached in their supervision of medical students. . More training in clinical problem presentations and effective medical workup. . Well-defined assessment plans need to be set up.
Organization	. There seems to be a structural shortage of clinical teaching staff (medical specialists) on the departments/wards. . Residents are important for providing clinical care on the wards.	. The use of protocols should be encouraged. . Additional residents are needed to meet the minimum number of residents required for an effective training programme.
Scholar	. Use is made of evidence-based medicine and this should be further encouraged.	. The importance of research should be acknowledged and stimulated.
Professionalism	. Attending physicians are important role models.	. The lecturer has to stimulate active participation of the listeners, rather than routine transfer of information (lecturer to trainee). . Specialists should be present during "hand-over" rounds and clinical meetings.
Health Advocate	. Not analysed	. Residents should be made responsible for their own education. . Bedside manners of specialists and residents require improvement.

tions was meant to manage this by standardizing their comments. Furthermore the visiting professors were carefully selected based on their structural involvement as teaching professionals in their respective teaching hospitals.

It was our intention in this study, through a quality assurance programme, to achieve a better educational infrastructure that would lead to the provision of better medical services in the hospital and to the community. To our knowledge, there is no structural audit programme of comparable nature that has involved external experts based on triangulation to improve the educational process in an environment similar to the one in this study. Furthermore, it has been shown that practising medicine in resource-limited environments has its advant-ages in developing certain competencies such as manage-ment and health advocacy (15) as well as good physical examination skills (16–18). We

believe that this report supplements earlier findings from studies that have explored the assessment of competency-based medical training in the Caribbean and other resource-limited environments validating the importance of improving clinical supervision and communication (6, 7, 9, 15).

REFERENCES

1. Prideaux D. Medical education in Australia: much has changed but what remains? Med Teach 2009; **31:** 96–100.
2. Cate OT. Medical education in The Netherlands. Med Teach 2007; **29:** 752–7.
3. Frank JR, ed. The CanMEDSs 2005 physician competency framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2005. [Accessed 2009 Sep 18]. Available from: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf
4. Scheele F, Teunissen P, Van Luijk S, Heineman E, Fluit L, Mulder H et al. Introducing competency-based postgraduate medical education in the Netherlands. Med Teach 2008; **30:** 248–53.
5. van Zanten M, Boulet JR. Medical education in the Caribbean: variability in medical school programs and performance of students. Acad Med 2008; **83:** S33–6.
6. Hardie EM. Current methods in use for assessing clinical competencies: what works? J Vet Med Educ 2008; **35:** 359–68.
7. Rafeek RN, Marchan SM, Naidu RS, Carrotte PV. Perceived competency at graduation among dental alumni of the University of the West Indies. J Dent Educ 2004; **68:** 81–8.
8. Busari OJ, Vervoort M, Hermans SM, Blom JR. Medical education in the new millennium – a Caribbean perspective. Med Educ 2001; **35:** 703–6.
9. Busari JO, Verhagen EA, Muskiet FD, Duits AJ. Implementation of a competency-based residency curriculum: experiences from a resource-limited environment in the Caribbean. Med Teach 2008; **30:** e189–95.
10. Iobst WF, Sherbino J, Cate OT, Richardson DL, Dath D, Swing SR et al. Competency-based medical education in postgraduate medical education. Med Teach 2010; **32:** 651–6.
11. Harris P, Snell L, Talbot M, Harden RM. Competency-based medical education: implications for undergraduate programs. Med Teach 2010; **32:** 646–50.
12. Frank JR, Snell LS, Cate OT, Holmboe ES, Carraccio C, Swing SR et al. Competency-based medical education: theory to practice. Med Teach 2010; **32:** 638–45.
13. Kuks JB. The bachelor-master structure (two-cycle curriculum) according to the Bologna agreement: a Dutch experience. GMS Z Med Ausbild 2010; **27:** Doc 33.
14. Thurmond VA. The point of triangulation. J Nurs Scholarsh 2001; **33:** 253–8.
15. Busari JO, Verhagen EA, Muskiet FD. The influence of the cultural climate of the training environment on physicians' self-perception of competence and preparedness for practice. BMC Med Educ 2008; **8:** 51.
16. Fagan MJ, Lucero ML, Wu EH, Diaz JA, Reinert SE. Attitudes toward the physical examination: a comparison of US and Dominican medical students. Teach Learn Med 2006; **18:** 287–91.
17. Gupta AR, Wells CK, Horwitz RI, Bia FJ, Barry M. The International Health Program: the fifteen-year experience with Yale University's Internal Medicine Residency Program. Am J Trop Med Hyg 1999; **61:** 1019–23.
18. Thompson MJ, Huntington MK, Hunt DD, Pinsky LE, Brodie JJ. Educational effects of international health electives on US and Canadian medical students and residents: a literature review. Acad Med 2003; **78:** 342–7.